RHODE ISLAND DEPARTMENT OF HEALTH

Asthma

in Rhode Island

Donald L. Carcieri, Governor
Patricia A. Nolan, MD, MPH, Director

State of Rhode Island
Department of Health
www.health.ri.gov

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STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Health

Patricia A. Nolan, MD, MPH
Director

Donald L. Carcieri
Governor

July 2004

Dear Rhode Islanders,

It is with great pleasure that I present to you *Asthma in Rhode Island*, a summary of reports on Rhode Island's Asthma burden, from the determinants of asthma to disparities in the burden of asthma and its associated health consequences. I sincerely hope that *Asthma in Rhode Island* proves useful to our community partners as they field new programs to control the consequences of asthma in our state.

I would like to thank all those who contributed to *Asthma in Rhode Island*, most especially Colleen Caron, PhD and John Fulton, PhD for their extensive contributions to this report.

The Rhode Island Department of Health is firmly committed to maintaining and enhancing its asthma surveillance system, convinced that successful prevention and control efforts are founded on complete, accurate, and timely data. In this vein, we plan to revise *Asthma in Rhode Island* annually. We hope you find this first edition to be useful and provocative.

Sincerely,

Patricia A. Nolan, MD, MPH
Director

Acknowledgements

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SUMMARY

Asthma is a leading chronic disease among both children and adults in the United States (Miller, 2000; Higgins, 2003; BRFSS, 2002). For reasons not fully understood, over the past two decades, there has been an apparent rise in the prevalence of lifetime asthma in the U.S., affecting 11 percent of adults in the year 2003 (Mannino et al. 2002; Rhodes, Moorman, Mannino, 2003, BRFSS, 2003). Indeed, New England states including Rhode Island, lead the nation in this rise in asthma prevalence where in the year 2002, 13 percent of adults reported being told they had asthma at some point in time (BRFSS 2002). The burden accompanying asthma is severe, marked by asthma attacks, excessive emergency room visits, hospitalizations, missed school and worked days. Whether separately or combined, these consequences give way to reduced quality of life at best, and at worst can be life-threatening (Miller, 2000; Higgins, 2003).

The burden associated with asthma is unevenly distributed disproportionately affecting children, women, urban, lower income, racial, and ethnic minorities at high rates (Boudreauzx, Redd, Mannino, 2003; Crain et al.; 1994). Although the cause of asthma is not fully understood, advancements made in this area strongly suggest asthma stems from multiple causes where genetics and environmental factors acting independently or in concert, play a role (Boudreauzx, Redd, Mannino, 2003; Crain et al.; 1994). In the absence of a clear understanding about how the suspected causal factors operate and without a reliable prevention or cure, asthma management remains our most effective approach. Asthma management through appropriate use of medication paired with avoidance of environmental triggers redirects the focus from once was a narrow emphasis on prevention to a management framework co-anchored in behavioral and environmental interventions.

Healthy People 2010

There can be few, if any, stronger official endorsements given to the significance over the rise in asthma prevalence and its accompanying morbidity than the inclusion of asthma objectives for both adults and children seen within Healthy People 2010. Central to asthma objectives in Healthy People 2010 is the reduction of asthma morbidity and uncontrolled asthma, specifically, reduced asthma deaths, hospitalizations, emergency room visits, and activity limitations. (For specific objective see Appendix C). Rhode Island, in extending national efforts driven by Healthy People 2010, translated the importance of asthma in Rhode Island by incorporating its own asthma-related objectives in a state-level version, Healthy Rhode Islanders 2010, aimed at reducing exposure to environmental tobacco amongst nonsmokers in Rhode Island's.

Social Mapping

Rhode Island's Asthma Control Program uses social mapping to locate the absolute burden of asthma within the Rhode Island population and to identify disparities in the relative burden borne by specific sub-populations. (Please note the definitions of absolute and relative burden in the definition box, below). Social mapping divides the state's population into multiple groups, defined by age, sex, socioeconomic status (SES), race and ethnicity. Absolute and relative burdens are reported in a standard format defined by these variables to identify audiences for media campaigns, and program interventions designed to create health-promoting environments for individuals living with asthma.

Definition

- Absolute burden is defined as the absolute number of state residents with asthma in a sub-population.
- Relative burden is defined as the proportion of state residents with asthma in a sub-population.

Example

- There are N persons in a specific sub-population. Of these N persons, n1 have asthma and N – n1 do not. The absolute burden of asthma in this sub-population is n1. The relative burden is n1/N.

Definition

- A health disparity is a difference in the relative burden of disease risk, disease, or disease outcome (disability, death) between two groups of people.

Data Sources

This report was created using data from five different sources: Rhode Island Behavioral Risk Factor Surveillance System (BRFSS 2002), Rhode Island Health Interview Survey (RI HIS 2001), Rhode Island Youth Tobacco Survey (YTS 2003), Rhode Island Hospital Discharge Data Set (HDD 2002), Rhode Island Vital Records Mortality Files (1990-2003).
NOTE: After analyses were conducted, RI BRFSS 2003 data set became available. Data analysis on race and ethnicity was modified prior to publication of this most recent version to include combined RI BRFSS data sets including RI BRFSS 2003. Among racial and ethnic minorities with asthma, the sample size is relatively small. Increasing sample size through combined years of the RI BRFSS enhances data accuracy. Moreover, not all asthma related questions are asked every year the survey is administered which prevents combining multiple years for those questions.

Data Aggregation

In the best case scenario, social mapping would segment audiences fully by age, sex, SES, race and ethnicity. Such segmentation could potentially optimize tailoring of asthma interventions, campaigns and policies. However, the preliminary construction of social maps using data sets yielded too few asthma cases from racial and ethnic minority groups, and traditional age categories to estimate burden reliably. As a result, the asthma control program for this report selected the following social map.

Table A Standard social map for the display of absolute and relative burden estimates of asthma in Rhode Island.

Ages	***Higher SES ****		***Lower SES *****				
	Male	Female	Male	Female	Male	Female	All
0-17							
18-44							
45-64							
65+							
18+							

* Higher SES: Family income > 200 % of the federally-defined poverty level, controlling for family size.

** Lower SES: Family income ≤ 200 % of the federally-defined poverty level, controlling for family size.

The Rhode Island Department of Health in general, and specifically the Office of Health Statistics and the Office of Minority Health are exploring ways in which standard public health surveys of Rhode Islanders may be enhanced to yield more usable data for the state's racial and ethnic minorities. In turn, HEALTH programs can utilize the social mapping for reaching subpopulations with health interventions including state-wide campaign efforts.

Summary of Key Findings

The data in this report made clear the burden of asthma in Rhode Island is a public health priority. The estimated prevalence of asthma both in adults and children is only underscored by the consistency in the disparities among subpopulations across the continuum of prevalence, exposure to triggers and health consequences. In Rhode Island;

- An estimated 1 in 8, (13 percent), adults aged 18 and older have ever been told they have asthma (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 5 children, (20 percent), in grades 6-12 have ever been told they have asthma (lifetime asthma), (YTS 2003)
- An estimated 1 in 7, (15 percent), women 18 and older have ever been told they have asthma, (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 10, (10 percent), men aged 18 and older have ever been told they have asthma (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 6, (17 percent) lower SES women aged 18 and older have ever been told they have asthma (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 7, (14 percent), higher SES women aged 18 and older have ever been told they have asthma (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 7, (15 percent), Black or African American Non-Hispanic adults reported having ever been told they have asthma (BRFSS 2001-2003)
- Approximately 40 percent of adults in Rhode Islander with lifetime asthma are exposed to at least 1 of 4 asthma triggers (current smoker, ETS, home dampness or mildew)
- Slightly over 64 percent of Rhode Island adults with current asthma have experienced at least one out of control asthma measure (see table 62 in appendix)

The Rhode Island Response to Asthma

After reviewing the burden of asthma in Rhode Island, available asthma control strategies, and national *Healthy People 2010* objectives, the Asthma Control Coalition selected interventions in six key areas to address the RI problem. These areas were extended in an RFP to focus their initiatives.

- Asthma Surveillance
- Assessment of Environmental Triggers
- Public Education
- Professional Education: Primary Care Providers
- Professional Education: School Nurse Teachers
- Advocacy for Asthma-Friendly Policies

INTRODUCTION

Asthma as a National Public Health Priority

Asthma, a chronic inflammatory disorder of the respiratory system, is one of the most common and costly chronic diseases in the United States affecting more than 17 million people (Lucas et al., 2001). The dramatic and unexplained rise in asthma prevalence is quickly becoming one of public health's greatest challenges, underscored by the expansion of asthma objectives in Healthy People 2010.

Drawing upon The Behavioral Risk Factor Surveillance (BRFSS) and the National Health Interview Survey (NHIS) which provide some of the most reliable estimates on asthma in the US, the lifetime asthma prevalence among U.S. adults for the year 2002 was 11.2 percent (BRFSS 2002). For 2002, some 12 percent of children had lifetime asthma according to the most recently released 2002 NHIS data (NCHS 2004).

Recognizing the distinction between lifetime and current asthma reveals a higher number of adults and children alike, who have lifetime asthma. Lifetime asthma refers to individuals who at some point in their lifetime were diagnosed with asthma whereas current asthma refers to those individuals who were diagnosed with asthma and currently had asthma at the time surveyed. Slightly over 7 percent, 7.2, adults reported having current asthma in the BRFSS 2002 (CDC, 2003) while 87 per 1,000 children have current asthma according to The National Health Interview Survey (2001). The rise in asthma burden in the US population is felt across all age groups, ethnicities, races, and both sexes.

Although the rise in asthma occurred across all populations, its distribution has not been uniform. The prevalence of asthma is higher in children compared to adults, boys compared to girls, adult women compared to adult men, economically poor families compared to non poor, and in urban compared to rural communities. Lower SES and minorities experience greater asthma morbidity including higher emergency room (ER) visits, hospitalizations and reduced access to health care services (Wood, 2002) (See table below).

The rise in asthma prevalence is met with an increase in overall asthma morbidity, generating noteworthy numbers in hospitalizations, restricted activity, and missed school days (Rhodes & Moorman, 2002; Lucas D, 2001). The associated direct and indirect costs of asthma total a noticeable sum estimated at $11.3 billion in 1998 an increase from $6 billion in 1990 (Lucas et al. 2001; Grupp-Phelan, Lozano, Fishman, 2001).

Adults: Prevalence Greater (Lifetime)	**Adults: Prevalence Lesser (Lifetime)**
• Women (13.6 percent) • Lower SES (15.5 percent, < $15,000) • Marginalized groups by race and/or ethnicity	• Men (10.2 percent) • Higher SES (10.2 percent, $50,000+) • Groups not marginalized by race and/or ethnicity

Source: National Findings from BRFSS 2002. CDC online prevalence data system, http://www.cdc.gov/brfss

Children: Prevalence Greater	**Children: Prevalence Lesser**
• Boys (14 percent) • Children in poor families (16 percent)	• Girls (10 percent) • Children not in poor families (11 percent)

Source: National Findings from HIS 2002

Asthma as a Rhode Island Public Health Priority

Asthma and its associated morbidity present serious and growing health challenges for individuals and society both nationally and in Rhode Island. Indeed, the prevalence of asthma is highest in the New England region; Rhode Island's results are on par with the rest of the New England states. The Rhode Island Department of Health, Division of Health Promotion and Chronic Disease Prevention, Epidemiology Unit uses a "social mapping" framework to identify population segments who have high prevalence of asthma and its associated morbidity.

Comparable to national efforts, the Rhode Island Asthma Control Program and its community partners have tailored their efforts, including the Asthma Control State Plan 2003-2008, to focus on asthma management through symptomatic medical care combined with efforts to control exposure to triggers. The Asthma Control Program Coalition and its subcommittees commit to achieving these goals and securing a high measure of quality of life for all Rhode Islanders who have asthma and their families.

The purpose of this report is to put asthma data into the hands of Rhode Islanders with asthma, program planners, and policy makers in a format for public consumption. State-wide data adds precision in locating where the primary burden of asthma resides. When that data is combined with expressed needs from the target population well-coordinated and winning asthma interventions are developed.

What is Asthma?

Asthma Definition and Levels of Severity

Asthma is a chronic inflammatory disorder of the airways characterized by airway constriction and chronic inflammation. Clinical signs include recurrent episodes of wheezing, breathlessness, chest tightness, and coughing. Once diagnosed, asthma is classified into four levels of severity – mild intermittent, mild persistent, moderate persistent, and severe persistent – based on frequency of symptoms, temporal occurrence, and results of peak flow or spirometry. These levels not only serve as taxonomy but are instrumental in tailoring asthma education and asthma management plans, key public health approaches in asthma treatment.

Classification of Asthma Severity

Classification	Days with Symptoms	Nights with Symptoms	Results of Peak Flow or Spirometry
Mild intermittent	≤ 2 times per week	≤ 2 times per month	Normal
Mild persistent	>2 times per week	3-4 times per month	Normal
Moderate persistent	Daily	≥ 5 times per month	60%-80% of normal
Severe persistent	Continual	Frequent	<60% of normal

Source: NIH, NHLB 1997

Asthma Determinants

The cause of asthma is not well understood, yet recent findings strongly suggest asthma stems from multiple factors linked to familial, infectious, allergenic, socioeconomic, psychosocial, and environmental sources (Boudreaxz et al. 2003; Erickson, Munzenberger, Planet, Kirking, Vanuya, 2002). Until a more clear understanding on how these causal factors interact, of which some include known asthma triggers, we can advance our most promising strategies, our efforts in asthma management. Improved patient education, appropriate medical management of symptoms, and public policies aimed at controlling environmental triggers, can reduce the occurrence of health consequences associated with asthma.

Asthma Management

Asthma can no longer be considered just a clinical issue. The increase in asthma, paired with substantial information on disease control, and little information on disease prevention, leads us to the conclusion that asthma management is an effective strategy in addressing this public health priority.

Managing asthma relies on two primary methods, medical management of symptoms combined with minimizing exposure to asthma triggers. The execution of both these efforts is contingent on a comprehensive understanding of asthma, its medical management, and triggers among individuals with asthma, their families, the health care system, and the larger community, schools and workplaces.

Toward this end, the Rhode Island Asthma Coalition commits to reducing undesirable health consequences from asthma through the combined efforts of state awarded CDC grants and the Rhode Island Asthma Control State Plan (2003-2008). Core to both developments, lies asthma management in the form of education and policies aimed at families, workplaces, and health care system, and expressly designed to reduce exposure to environmental triggers and promote proper use of medication.

Medical Management of Asthma

Asthma symptoms, hospitalizations, and ER visits can be reduced through appropriate use and sustained adherence to prescribed asthma medications. The National Institutes of Health (NIH) National Asthma Education and Prevention Program guidelines shape asthma therapy, appropriate to the level of severity subdivided into long-term control and quick-relief.

Asthma Guidelines

The National Institutes of Health (NIH) National Asthma Education and Prevention Program (NAEPP) outlined the most formalized set of asthma care guidelines in the 1997 NAEPP Expert Panel Report: "Guidelines for the Diagnosis and Management of Asthma". These guidelines established criteria defining asthma severity categories and identified four components of asthma treatment: objective measurements of disease activity, medication treatment, environmental control measures, and education.

Table Overview of Asthma Therapy

	Long-term Control	Quick Relief
Step 1: Mild intermittent	No daily medication	Short-acting bronchodilator as needed for symptoms (but should not be ≥ 2times per week)
Step 2: Mild persistent	Daily anti-inflammatory medication: either cromolyn or nedocromil sodium or low-dose inhaled corticosteroid or possibly a leukotriene antagonist	Short-acting bronchodilator as needed for symptoms
Step 3: Moderate persistent	Daily anti-inflammatory medication: either medium-dose inhaled corticosteroid or low-to medium-dose inhaled corticosteroid and nedocromil, long-acting B-agonist, or leukotriene antagonist	Short-acting bronchodilator as needed for symptoms
Step 4: Severe persistent	Daily anti-inflammatory medication: High-dose inhaled corticosteroid and long-acting B-agonist and/or leukotriene antagonist and/or sustained-release theophylline and/or oral corticosteroid	Short-acting bronchodilator as needed for symptoms

Source: JAMA 2002, 288, (6) Robert Wood

Asthma Triggers

Along with medical management of asthma symptoms, education and policies aimed at the avoidance of exposure to asthma "triggers" are a key element of any effective management protocol. Triggers include irritants or allergens that cause asthma exacerbations in sensitized patients:

- Allergens, such as cats, dogs, mites, cockroaches, grain, mold, and pollen
- Cigarette smoke
- Respiratory infections, such as influenza and pneumonia
- Exercise

Health Consequences of Asthma / Asthma Morbidity

The health consequences associated with asthma are both severe and many. Hospitalizations, emergency department visits, outpatient visits, missed school and work days, and death are but some that can dramatically diminish the quality of life among individuals with asthma. In 2002, the aggregate hospital discharge costs attributed to a primary diagnosis of asthma was slightly over 4 billion dollars (HCUPnet, 2002). National data on asthma morbidity are found below.

Asthma morbidity disproportionately affects individuals from poverty, racial, or ethnic minority status, and adult women (Boudreauzx et al., 2003; Grant, Lyttle, Weiss, 2000). Collectively, these consequences place a significant burden on the quality of life among individuals with asthma, their families and communities, and pose great challenges to the health care system.

Asthma Morbidity

Year: 2000	Adults (per 10,000)	Children (per 10,000)
Outpatient visits	285	649
Emergency Department visits	54	104
Hospitalizations	12	30
Deaths	2.1	.3

Source: US DHHS National Health Interview Survey 2001
Note: Age adjusted to 2000 population

Asthma Health Objectives

National Healthy People 2010

Asthma has been identified as a public health priority both nationally and within the state of Rhode Island. Healthy People 2010 focuses on asthma management and identifies four separate objectives specific to reducing asthma morbidity.
1) reduce asthma deaths;
2) reduce hospitalizations for asthma;
3) reduce hospitalization emergency department visits for asthma; and
4) reduce activity limitations among persons with asthma.

The first three objectives divide further into 2010 targets unique to specific age groups. Such uniquely tailored targets for individual age groups underscores both the variability observed in asthma management found among age groups and highlights the need to tailor interventions based on those variations and where asthma management is most problematic.
(See Appendix C for national HealthyPeople 2010 asthma-specific objectives).

Healthy Rhode Islanders 2010

The publication of Healthy Rhode Islanders 2010 models Healthy People 2010, designed to outline health objectives in step with Healthy People 2010 yet tailored to Rhode Island. In doing so, Rhode Island adopted the health objective aimed at reducing exposure to ETS, a known asthma trigger, from Healthy People 2010.

Healthy Rhode Islanders 2010

By 2010:	RI Baseline	2010 Target	RI Current
• Reduce the proportion of nonsmokers exposed to environmental tobacco smoke	39% (1988-1994)	20%	--

-- Data not available

METHODS

Data Sources

The Rhode Island data sets used for the social maps in this report include the 2002 Rhode Island Behavioral Risk Factor Surveillance System (RI BRFSS), the 2001 Rhode Island Health Interview Survey (RI HIS), the 2003 Youth Risk Tobacco Survey (YTS), 2002 Hospital Discharge Data, and Vital Record Data 1990-2003 (See Appendix A). To provide the most current data, the data derives from the most recent available years. Data are presented in the social map graphs allowing the reader to identify both **burden** and **disparities**.

Data are presented for adults from both the BRFSS 2002 and the RI HIS 2001 and for children, the RI HIS and the YTS.

NOTE: After analyses were conducted, RI BRFSS 2003 data set became available. Data analysis on race and ethnicity was modified prior to publication of this most recent version to include combined RI BRFSS data sets including RI BRFSS 2003. Among racial and ethnic minorities with asthma, the sample size is relatively small. Increasing sample size through combined years of the RI BRFSS enhances data accuracy. Moreover, not all asthma related questions are asked every year the survey is administered which prevents combining multiple years for those questions.

Social Mapping

From these data sets, points representing asthma distribution across subgroups are arranged within the social map; this reveals the burden and the relative burden (disparities) within the RI population. Social mapping, in part, is grounded in a combination of health behavior theories, most notably ecological models and social marketing. In alignment with the multi-faceted nature of asthma, social mapping shifts focus from conventional disease-oriented models and emphasizes the importance of a population-model, focusing on interactions between populations and their environment. Subgroups and environments where asthma is most problematic are strategically targeted with tailored interventions, campaigns, and policies effective at reducing asthma's burden and disparities.

Social Mapping Measures

Socioeconomic status: Socioeconomic status is measured as: (1) Household income is at or below 200% of the U.S. Census federal poverty threshold versus household income above 200% of the poverty threshold.

Race/ethnicity: Race and ethnicity groups are grouped into four groups: (1) White, Non-Hispanic, (2) Black or African-American, Non-Hispanic, (3) Hispanic, (4) Other. Other combines categories, "other, Non-Hispanic" and "multi-racial, Non-Hispanic".

Sex: Sex is defined as (1) Male, and (2) Female.

Age: Age is grouped into five categories (1) 0 to 17, (2) 18 to 24, (3) 25 to 44, (4) 45 – 64, and (5) 65 and older.

Rhode Island Population Size and limitations in Rhode Island's Social Map

Having just over 1 million residents, the size of the total population in Rhode Island is small. The modest population size combined with the overall prevalence rate of asthma in Rhode Island is a data limitation that reduces the amount of optimal population segmentations. The social map for asthma in Rhode Island is defined by socioeconomic status, sex, and age groups (See Table A).

A second limitation, directly related to the first, is the reduced ability to detect a statistically significant difference among groups when sample sizes are extremely small. Data are presented in a graphical format that allow the reader to identify both **burden** and **disparities**.

Table A Standard social map for the display of absolute and relative burden estimates of asthma in Rhode Island.

Ages	***Higher SES ****		***Lower SES *****				
	Male	Female	Male	Female	Male	Female	All
0-17							
18-44							
45-64							
65+							
18+							

* Higher SES: Family income > 200 % of the federally-defined poverty level, controlling for family size.

** Lower SES: Family income ≤ 200 % of the federally-defined poverty level, controlling for family size.

Burden and Disparities

The data presented includes: burden, estimated number of individuals, and disparities, estimated percentages of asthma prevalence, triggers, and health consequences by age groups, sex, and poverty stratified by sex. **Burden** and **disparities** are both important for health planning, yet provide very different information. **Burden** and **disparity** allow health planners, programs, and policy makers enhanced capability to project and allocate resources to population groups most in need.

Burden is the estimated number of individuals with asthma or asthma health consequence in Rhode Island. This measure supplies data to health planners, programs and policy makers in Rhode Island for projections on total health care needs and costs related to asthma.

Example: Estimated number of women aged 18-44 with asthma

Disparities are comparisons in the relative burden of asthma and its associated health consequences between different groups. The percentage (%) is the estimated relative burden. The relative burden is the percentages of those individuals with the condition as a proportion of those with and without the condition for that particular subgroup. When a particular subgroup has a higher relative burden, a disparity may be suggestive.

Health planners, programs, and policy makers in Rhode Island can use information on **disparities** to target interventions and channel resources to specific groups who have a higher percentage of asthma or an asthma consequence compared to other groups.

Example: Disparity $\left(\frac{\text{Number of women aged 18-44 with asthma}}{\text{Total number of women aged 18-44 with and without asthma}} \right) \text{ X } 100$

Percentages in the disparity graphs do not add to 100%. These estimated are based on analyses that exclude missing data and the response choices "don't know" and "refused".

Relative Risk

The relative risk determines the risk of having a condition, for example asthma, in one group, for example females, compared to the risk in another group, males. The relative risk is a measure of the strength of the relationship between the health condition, for example, asthma, and one of the populations groups, for example, age group. The relative risk assists in determining whether the magnitude of the difference between any two groups, such as the 10 percent of lifetime asthma prevalence in men and the 15 percent in women is large enough to be a meaningful and/or statistically significant. In this example, men are the reference group and women are 1.5 times more likely than men to have lifetime asthma.

Example 15.0% / 10.0% = 1.5 relative risk

Relative risk illustrates the likelihood of having the condition, for example asthma, in one group, females, compared to another group, males. Or in the case of age, they indicate the likelihood of having asthma among 18-44 year olds or 45-64 year olds compared to 65 and older. Each example presents a reference group; men provided the reference group for women; individuals 65 and older provided the reference group for the two other age groups. Or stated another way, women are the comparison group for men, younger age groups are the comparison group for older age groups, and lower SES groups are the comparison for higher SES groups.

In this report, men are always the reference group to women. The oldest adult age group available is always the reference group for the two younger adult age groups. Lower SES is always the reference group for the higher SES group.

Relative risks greater than 1.0 indicate an increased likelihood for that particular group, women to have the condition compared to the reference group, men. A relative risk less than 1.0 indicates a decreased likelihood of having the condition compared to another group.

The relative risks are estimated to the Rhode Island population, consistent with the burden and disparity estimates. Statistical significance for the relative risk is at the .05 level ($p<.05$). Relative risk found to be statistically significant may not be practically significant. For example, a relative risk of 1.4 may be statistically significant although 1.4 times more likely is relatively small. The diagram displayed below aids in interpreting the practical significance as small, medium, large, and very large of any given statistically significant relationship.

Strength of Relationship: Relative Risk

Small	Moderate	Large	Very large
1.5 to 1.9	1.9 to 3.0	3.0 to 5.7	5.7 to 19

Supplemental Technical Notes:

Data was analyzed using Sudaan version 8.0 and SAS version 8.2 proc surveymeans to account for complex survey design in the BRFSS, RI HIS and YTS.

All Rhode Island data on asthma, burden, disparity, relative risks, are weighted estimates.

Survey data estimates are not shown if the weighted relative standard error is greater than 30 percent. This criterion is used for the burden and disparity. An asterisk is placed in the graph and the detailed table cell is shaded grey (in Appendix B) to indicate insufficient sample size or data unstable.

Rhode Island-specific asthma data presented are crude estimates and are not age-adjusted unless otherwise indicated. The decision or benefits associated with crude or age-adjusted rates depends in part on what the needs are for reporting that information. Crude or unadjusted rates represent the actual experience of the population and provide data for the allocation of health resources and public health planning. Age-adjusted rates provide a summary value that removes the effect of the differences in population structure to allow for valid comparisons between groups over time. For example, age-adjusted rates would remove the differences in asthma observed between Hispanics and Non-Hispanic whites in the U.S. that arise from the occasion that Hispanics in the U.S. are comparatively younger, and asthma is more common in children compared to adults.

Sample Size

The number of individuals in the survey sample that had asthma was relatively small. This may prevent seeing an association when in fact an association exists. This is particularly relevant for the sample size of males throughout all analysis and in any analysis other than asthma prevalence. For example the number of individuals with asthma in the sample and exposure to any of the four asthma triggers or any asthma control measures was small. Again, this may prevent us seeing an association when in fact an association does exist.

NOTE: After analyses were conducted, RI BRFSS 2003 data set became available. Data analysis on race and ethnicity was modified prior to publication of this most recent version to include combined RI BRFSS data sets including RI BRFSS 2003. Among racial and ethnic minorities with asthma, the sample size is relatively small. Increasing sample size through combined years of the RI BRFSS enhances data accuracy. Moreover, not all asthma related questions are asked every year the survey is administered which prevents combining multiple years for those questions.

ASTHMA PREVALENCE IN RHODE ISLAND

Differences Between Survey Findings

Differences occur on some of the same measures between the two surveys, BRFSS 2002 and HIS 2001. The reasons for such differences stem from a variety of causes.

In part, the two surveys use different collection methodologies. Specific to adults and the BRFSS and RI HIS, the BRFSS is a self-report survey administered to individual adults who answer questions for themselves only. The RI HIS collects data from a single adult member within a household who answers survey questions not only for themselves, but also for all household members. By answering questions for all household members "by proxy", the RI HIS introduces additional error to the answers given on behalf of other household members, error not introduced in the BRFSS.

Specific to asthma data on children, responses on the YTS and the RI HIS cannot be compared as the YTS measures lifetime asthma and the RI HIS measures current asthma. Additionally, and similar to reasons cited above in the between the BRFSS and RI HIS, the YTS uses a different data collection method from the RI HIS (described in above paragraph) where children answer the questions themselves on the YTS survey.

Another reason possibly explaining the different results between surveys is the slightly different language used in questions for the same measures. Also playing a role, may be the different years the surveys were administered.

How Asthma Prevalence is Measured

Measuring asthma prevalence is less straightforward as might be initially thought. Asthma prevalence is classified into two categories, "lifetime asthma" and "current asthma"; these measures extend beyond taxonomy and have important clinical and practical implications.

Current asthma describes and measures those individuals who have been diagnosed with asthma and still have asthma at the time of the survey.

Lifetime asthma describes and measures individuals who have been diagnosed with asthma at any point in their lifetime, including those who no longer have apparent clinical symptoms.

Lifetime asthma will include all those who have current asthma in addition to those diagnosed who no longer have clinical symptoms.

The distinctions between the two, lifetime and current, have practical and clinical implications for projections of health care needs and costs. Individuals with current asthma are more likely to draw upon health care services, including ER visits, hospitalizations, and activity limitations; as such, only those with current asthma were asked questions in the BRFSS in connection to these health consequences. Lifetime asthma prevalence can inform the design of programs and policies concerned with asthma triggers, as such irritants may pose heightened risks to the respiratory system in individuals ever diagnosed with asthma compared to those without asthma.

Current Asthma Prevalence Among Adults

Survey Questions

BRFSS 2002

Current asthma is defined as those who have been diagnosed with asthma and still have asthma. Adults aged 18 and older who replied yes to both questions are determined to have current asthma

- Have you ever been told by a doctor or other health professional that you had asthma
- Do you still have asthma

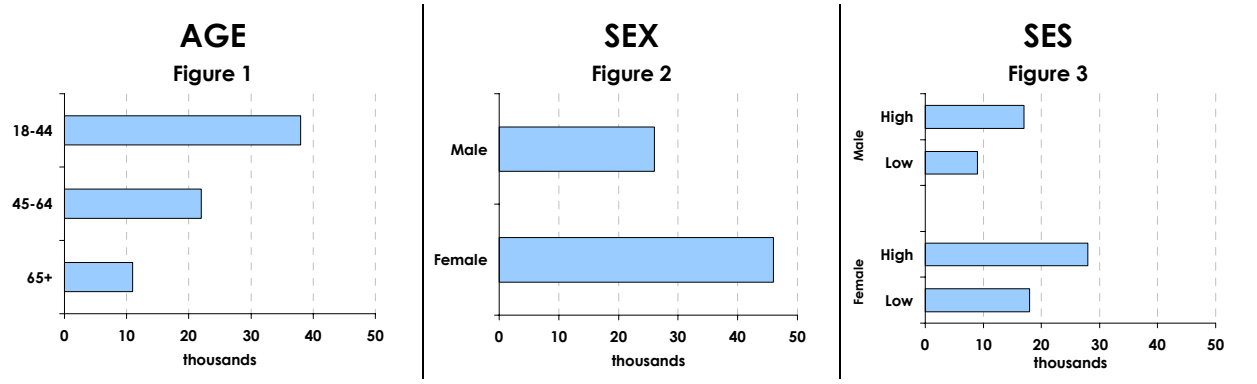
RI HIS 2001
Asthma prevalence for adults aged 18 and older was determined from the RI HIS 2001 questions and individuals who replied yes to both questions.

- Does anyone in the household have asthma
- Did a doctor say that he/she has asthma

Current Asthma Prevalence Among Adults: Burden

In Rhode Island, an estimated 71,279 adults aged 18 and older reportedly have current asthma (BRFSS 2002). Slightly less, 62,299 adults, reported current asthma in the RI HIS (2001). The Rhode Island total population is slightly over 1 million people (US Census, 2000). In both surveys, when looking across the age groups, the greatest estimated number of adults with current asthma was among 18-44 year olds. Between males and females, the greatest estimated number observed was among females.

Estimated number of Rhode Island adults (in 1000's) with current asthma by age, sex, SES, 2002. **# (1000s) BRFSS**



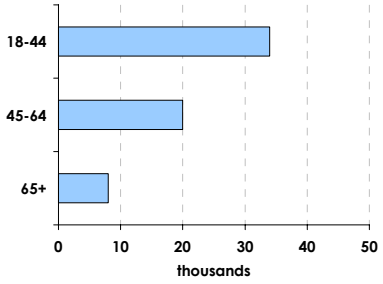
Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES

Estimated number of Rhode Island adults (in 1000's) with current asthma by age, sex, SES, 2001.

 # (1000s) **HIS**

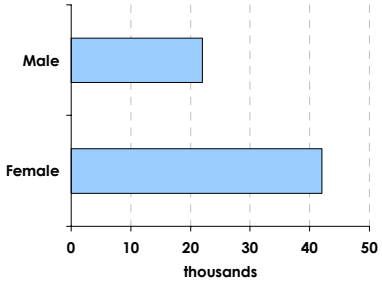
AGE

Figure 4



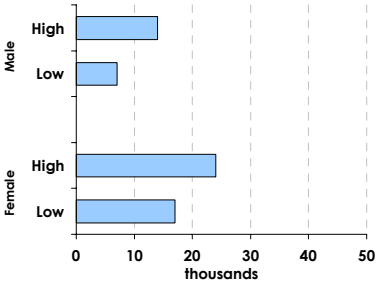
SEX

Figure 5



SES

Figure 6



Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.

Current Asthma Prevalence Among Adults: Disparities

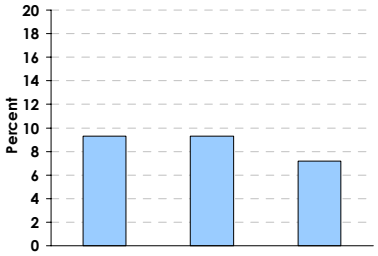
In Rhode Island, an estimated 8.9 percent of adults aged 18 and older have current asthma (BRFSS 2002) versus 7.8 percent in the RI HIS (2001). In the BRFSS, 9.3 percent of both 18-44 year olds and 45-64 year olds reported current asthma compared to 7.2 percent among 65 years and older. A similar pattern was observed in the RI HIS where 8.4 percent of 18- 44 and 45-64 year olds reported current asthma compared to 5.3 percent among 65 years and older. An estimated 10.8 percent of females compared to 6.8 percent males (BRFSS 2002) reported current asthma. A similar pattern between females and males was observed in the RI HIS (2001).

Based on these estimates, 18-44 year olds and 45-64 year olds were both 1.3 times more likely than 65 years and older to currently have asthma (BRFSS 2002). Similarly in the RI HIS (2001), 18-44 year olds and 45-64 year olds were both 1.6 times more likely to currently have asthma than 65 years and older. Females were 1.6 times more likely than males to currently have asthma (BRFSS 2002). A similar pattern between females and males was observed in the RI HIS (2001). In both surveys, lower SES females were 1.3 times more likely than higher SES females and lower SES males were 1.0 times as likely as higher SES males.

Estimated percentage of Rhode Island adults with current asthma, by age, sex, SES, 2002. **%** **BRFSS**

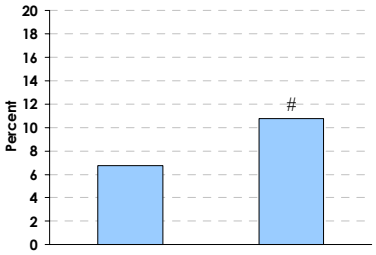
AGE

Figure 7



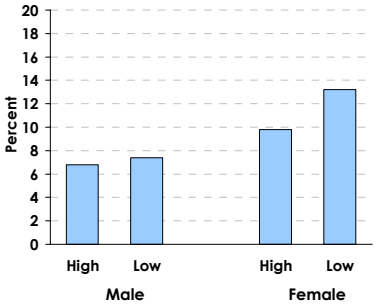
SEX

Figure 8



SES

Figure 9

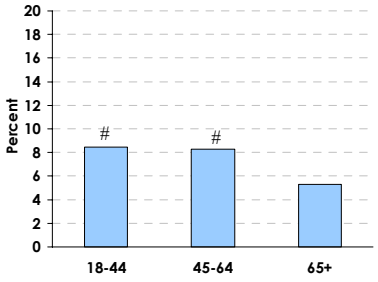


Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
* Data not shown if weighted relative standard error > 30%
\# Estimated relative risk is statistically significant ($p<0.05$): reference group is males
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Estimated percentage of Rhode Island adults with current asthma, by age, sex, SES, 2001. **%** **HIS**

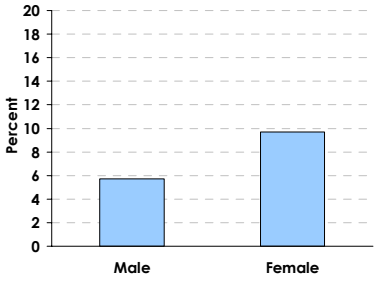
AGE

Figure 10



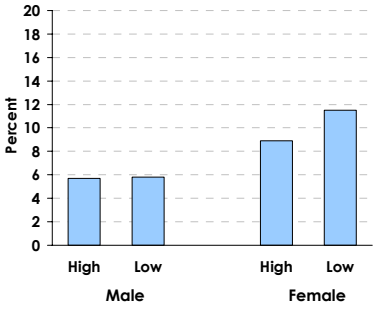
SEX

Figure 11



SES

Figure 12



Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Estimated relative risk is statistically significant (p<0.05): reference group is 65+
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Current Asthma Prevalence by Race and Ethnicity Among Adults

Consistent with national statistics, in Rhode Island, the estimated prevalence of current asthma among adults 18 and older was higher in Black / African-American Non-Hispanic, 12 percent, compared to Hispanic, 7 percent and White Non-Hispanic 9 percent. Small sample size prevents analysis by age, sex, and SES in any of the racial or ethnic minority subpopulations. As displayed above, data presented by age, sex, and SES is for all racial and ethnic groups combined. Due to small sample size in racial and ethnic minority populations, data is not presented within the social map by age, sex, and poverty status.

Current Asthma Prevalence Among Adults 18+ in Rhode Island 2001-2003: Disparity

Race / Ethnicity	Prevalence
• White, Non-Hispanic	9.2%
• Black or African-American, Non-Hispanic	12.3%
• Hispanic	7.1%
• Other	12.9%

Source: Weighted data from the 2001-2003 Behavior Risk Surveillance System. Age not adjusted. Please see Method section (page 10) for explanation on adjusted and not adjusted data.

NOTE: After analyses were conducted, RI BRFSS 2003 data set became available. Data analysis on race and ethnicity was modified prior to publication of this most recent version to include combined RI BRFSS data sets including RI BRFSS 2003. Among racial and ethnic minorities with asthma, the sample size is relatively small. Increasing sample size through combined years of the RI BRFSS enhances data accuracy. Moreover, not all asthma related questions are asked every year the survey is administered which prevents combining multiple years for those questions.

Current Asthma Prevalence Among Adults by Urban Residence

In Rhode Island, an estimated 9 percent of adults 18 and older residing in the urban core compared to 8 percent in the non-urban core currently have asthma (BRFSS 2002). In Rhode Island, the urban core is defined by six geographic regions, not all of which are contiguous. Central Falls, Newport, Pawtucket, Providence, West Warwick, and Woonsocket comprise the Rhode Island's urban core.

Current Asthma Prevalence Among Adults 18+ in Rhode Island: Disparity

Urban Core versus Non urban Core	Prevalence
• Urban Core	9.6%
• Non urban Core	8.5%

Source: Weighted data from the 2002 Behavior Risk Surveillance System. Age not adjusted. Please see Method section (page 10) for explanation on adjusted and not adjusted data.

Lifetime Asthma Prevalence Among Adults

Survey Questions

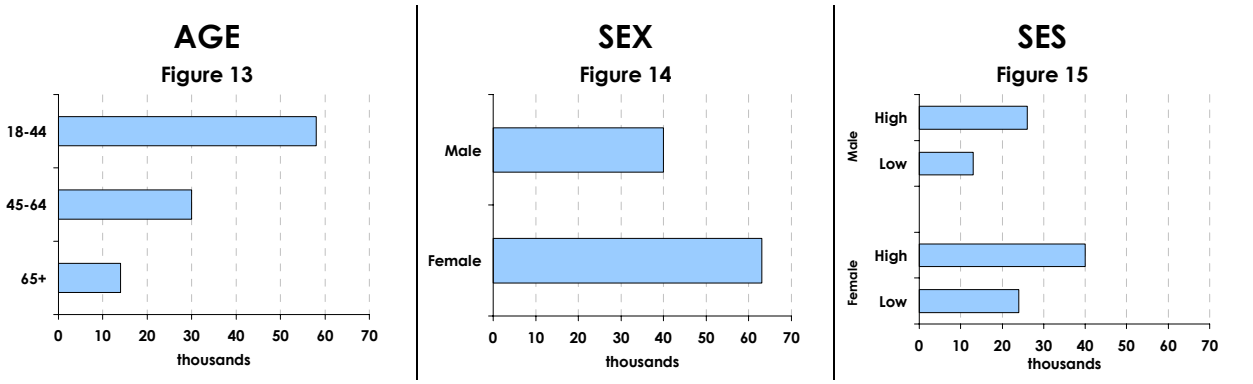
BRFSS 2002
Lifetime asthma prevalence for adults aged 18 and older was defined as those at risk for having been told sometime in their lifetime by a doctor, nurse or health professional that they had asthma.

- At Risk = Have been told by a doctor, nurse or health professional that they had asthma
- Not at Risk = Have not been told by a doctor, nurse, or health professional that they had asthma.

Lifetime Asthma Prevalence Among Adults: Burden

In Rhode Island, an estimated 103,315 adults aged 18 and older reportedly have lifetime asthma (BRFSS 2002). Of this total, among age groups, the younger adult age group had the greatest estimated number of lifetime asthma. Between males and females, females had the greater estimated number of lifetime asthma.

Estimated number of Rhode Island adults (in 1000's) with lifetime asthma by age, sex, SES, 2002. **# (1000s) BRFSS**



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES

Lifetime Asthma Prevalence Among Adults: Disparities

In Rhode Island, an estimated 13 percent of adults 18 and older have lifetime asthma (BRFSS 2002). Similar to current asthma (BRFSS 2002), females had a greater lifetime asthma prevalence, 14.9 percent, than males, 10.6 percent. The estimated lifetime asthma prevalence was higher in the 18-44 age group compared to the 65 and older age group, 14.3 percent vs 9.4 percent respectively. Close to 10 percent in both lower and higher SES males reported lifetime

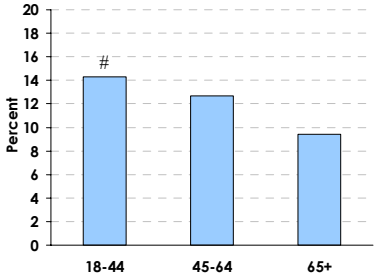
prevalence. The same measure was 17.2 percent and 14.1 percent respectively, in lower and higher SES females.

Based on the estimated percentages and represented in the figures below, the relative risk of having lifetime asthma was 1.5 times more likely in 18-44 year olds than 65 years and older (BRFSS 2002). The 45-64 year olds were 1.4 times more likely to have lifetime asthma than 65 and older age group. Women were 1.5 times more likely to have lifetime asthma than men. Among SES groups, lower SES men were 1.1 times more likely than higher SES men and among women, lower SES women were 1.2 times more likely than higher SES women.

Estimated percentage of Rhode Island adults with lifetime asthma, by age, sex, SES, 2002. **%** **BRFSS**

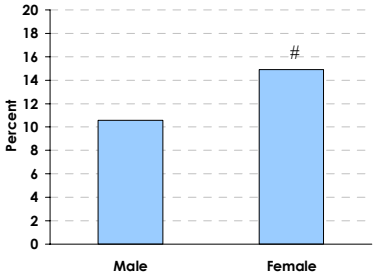
AGE

Figure 16



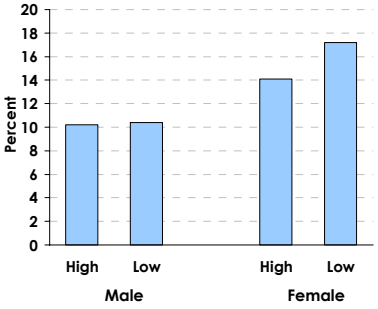
SEX

Figure 17



SES

Figure 18



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Estimated relative risk is statistically significant (p<0.05): reference group is 65+; reference group is males
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Lifetime Asthma Prevalence by Race and Ethnicity Among Adults

As observed with current asthma, the estimated lifetime asthma prevalence among adults 18 and older was highest among Blacks / African-Americans Non-Hispanic compared to Hispanic and White Non-Hispanic. Lifetime asthma includes ever being told one has asthma in one's lifetime. As displayed above, data presented by age, sex, and SES is for all racial and ethnic groups combined. Due to small sample size in racial and ethnic minority populations, data is not presented within the social map by age, sex, and poverty status.

Lifetime Asthma Prevalence Among Adults 18+ in Rhode Island 2001-2003: Disparity

Race / Ethnicity	Prevalence
• White, Non-Hispanic	13.0%
• Black or African-American, Non-Hispanic	15.5%
• Hispanic	10.0%
• Other	17.7%

Source: Weighted data from the 2001-2003 Behavior Risk Surveillance System. Age not adjusted. Please see Method section (page 10) for explanation on adjusted and not adjusted data.

NOTE: After analyses were conducted, RI BRFSS 2003 data set became available. Data analysis on race and ethnicity was modified prior to publication of this most recent version to include combined RI BRFSS data sets including RI BRFSS 2003. Among racial and ethnic minorities with asthma, the sample size is relatively small. Increasing sample size through combined years of the RI BRFSS enhances data accuracy. Moreover, not all asthma related questions are asked every year the survey is administered which prevents combining multiple years for those questions.

Lifetime Asthma Prevalence by Urban Core Among Adults

An estimated 14.3 percent of adults residing in the urban core compared to 12.2 percent living in the non-urban core reported having lifetime asthma (BRFSS 2002).

Lifetime Asthma Prevalence Among Adults 18+ in Rhode Island: Disparity

Urban Core versus Non urban Core	Prevalence
• Urban Core	14.3%
• Non urban Core	12.2%

Source: Weighted data from the 2002 Behavior Risk Surveillance System. Age not adjusted. Please see Method section (page 10) for explanation on adjusted and not adjusted data.

Asthma Prevalence Among Children: Lifetime (YTS) and Current (RIHIS)

Survey Questions

Asthma prevalence was determined and is presented from the YTS 2003 and the RI HIS 2001 survey questions. The two surveys differ on two measures preventing comparisons between the two surveys. The YTS measures lifetime asthma while the RI HIS measures current asthma. YTS data is presented for children in grades 6-8 and 9-12. RI HIS data is presented for children aged 0-17. Due to small sample sizes, the RI HIS asthma data on children could not be further divided into age categories comparable to the YTS. For the RI HIS, children were determined to have asthma who answered yes to both questions.

YTS (Lifetime)

- Have you ever been told by a doctor, nurse or other health professional that you had asthma

RI HIS (Current)

- Does anyone in the household have asthma
- Did a doctor say that he/she has asthma

Lifetime and Current Asthma Prevalence Among Children: Burden

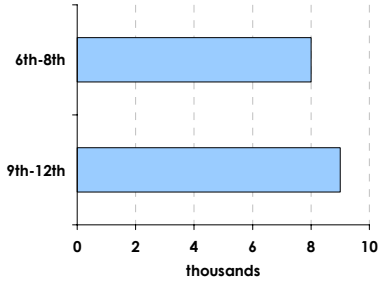
An estimated 9,175 Rhode Island children in grades 9 through 12 have lifetime asthma paired with an estimated 7,568 Rhode Island children in grades 6 through 8 that have lifetime asthma (YTS).

In Rhode Island, an estimated 24,751 children aged 17 and younger currently have asthma, 14575 males and 10171 females (RI HIS 2001).

Estimated number of Rhode Island children (in 1000's) with lifetime asthma among children by grade and sex, 2003. **# (1000s)** **YTS**

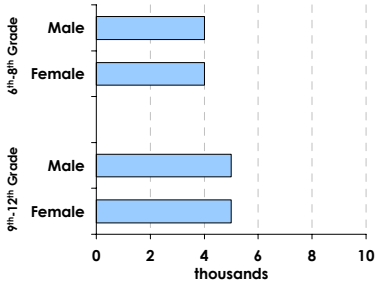
AGE

Figure 19



SEX

Figure 20



SES

DNA$^{\Omega}$

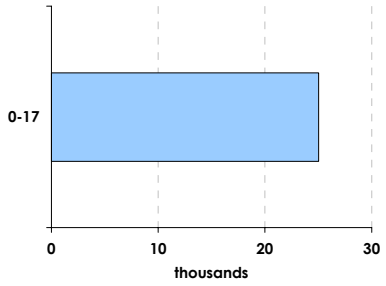
Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES
$^{\Omega}$ Data not available

Estimated number of Rhode Island children (in 1000's) with current asthma by age, and sex, 2001.

 # (1000s) **HIS**

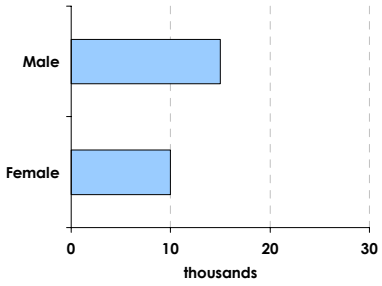
AGE

Figure 21



SEX

Figure 22



SES

DNS*

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Lifetime and Current Asthma Prevalence Among Children: Disparities

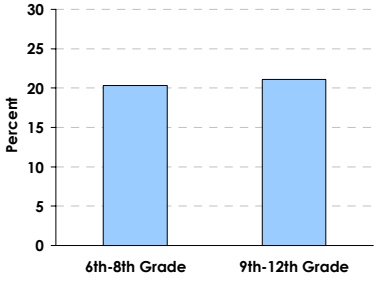
The estimated percentages of lifetime asthma among children in grades 6 through 8, and grades 9 through 12, were similar, 20.3 and 21.1 percent respectively (YTS). Negligible disparities occurred between males and females, holding true for both middle and high school.

The RI HIS includes children aged 17 and younger and measures current asthma, preventing comparisons with the YTS. Hence, the RI HIS provides an estimation of asthma in Rhode Island among younger age children than the YTS, and reports on current asthma. An estimated 10 percent of children aged 17 and younger currently have asthma.

Estimated percentage of Rhode Island children with lifetime asthma among children by grade and sex, 2003. **%** **YTS**

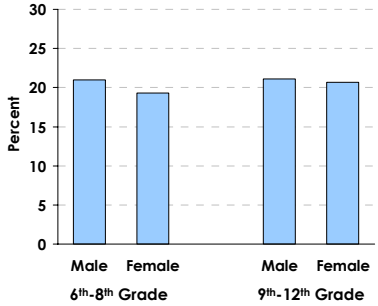
AGE

Figure 23



SEX

Figure 24



SES

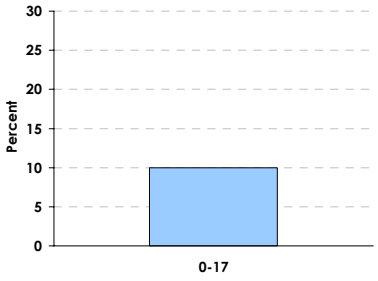
DNA$^{\Omega}$

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
$^{\Omega}$ Data not available

Estimated percentage of Rhode Island children with current asthma, by age and sex, 2001. **%** **HIS**

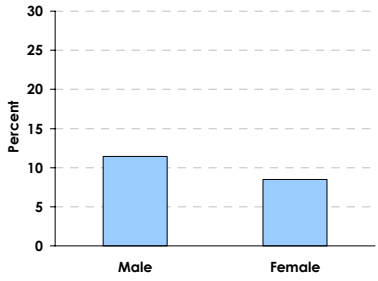
AGE

Figure 25



SEX

Figure 26



SES

DNS*

Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
* Data not shown if weighted relative standard error > 30%

ASTHMA TRIGGERS IN RHODE ISLAND

Asthma exacerbations are associated with irritants, more commonly known as "triggers." Triggers include particulate matter and other substances in tobacco smoke and vehicular exhaust, dust mites, pet dander, cockroach feces, mold spores, pollen, and strong odors. Activity, respiratory infections, and climate can also precipitate asthma attacks. Asthma exacerbations can result in unwanted hospitalizations, ER visits, and decreased quality of life. Because there is no known cure for asthma to date, key strategies in asthma management are minimizing exposure to, and reducing the amount of triggers in the environment.

Data on exposure to triggers is presented for lifetime asthma within the BRFSS and current asthma within the RI HIS. Individuals who at some time in their life had asthma may have increased sensitivity to triggers compared to individuals never diagnosed with asthma. For this reason, data on exposure to triggers by individuals with lifetime asthma is presented when available, in the BRFSS. Because the RI HIS measures current asthma, exposure to triggers is among individuals with current asthma. Additionally, as some triggers are known causes for asthma, tobacco smoke, exposure to triggers is also presented for the total population without asthma.

Data is presented on exposure to each asthma trigger separately as well as exposure to a combined measure that includes all 4 asthma triggers. Knowledge on the percent of people with asthma exposed to any of the 4 triggers is beneficial for program interventions as asthma interventions focusing on environmental triggers commonly include educational information on all 4 triggers.

Exposure to 1 of 4 Asthma Triggers

The four asthma triggers, tobacco use, environmental tobacco smoke, household dampness and household mildew, were combined to create a single summary measure. Adults aged 18 and older who replied yes to exposure to at least one of the 4 triggers are displayed below.

Exposure to 1 of 4 Asthma Triggers Among Adults: Burden

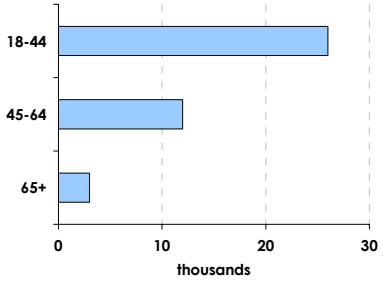
In Rhode Island, an estimated 41,016 adults aged 18 and older with lifetime asthma were exposed to at least 1 of 4 asthma triggers (BRFSS 2002) with women reportedly suffering the greatest burden. An estimated 26,975 adults with current asthma were exposed to at least 1 of 4 asthma triggers (HIS 2001).

Estimated number of Rhode Island adults (in 1000's) with lifetime prevalence exposed to 1 of 4 triggers by age, sex, SES, 2002.

 # (1000s) BRFSS

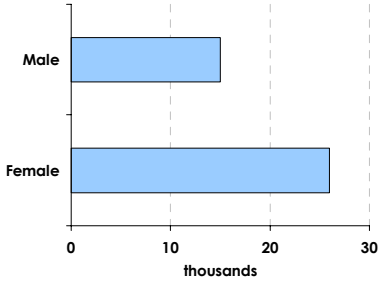
AGE

Figure 27



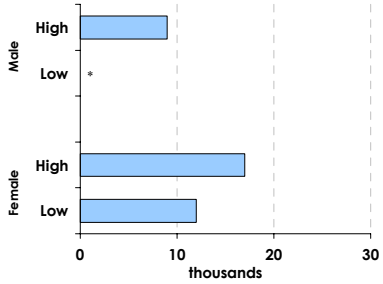
SEX

Figure 28



SES

Figure 29



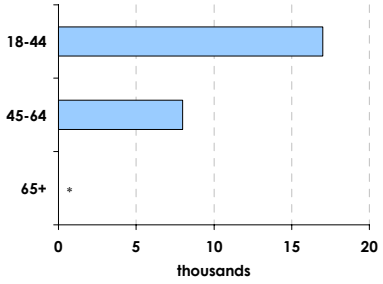
Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to 1 of 4 triggers by age, sex, SES, 2001.

 # (1000s) HIS

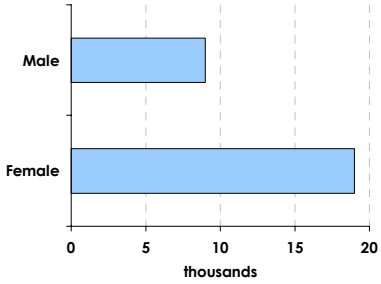
AGE

Figure 30



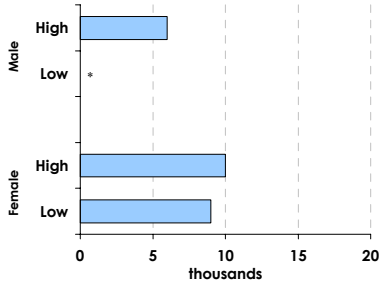
SEX

Figure 31



SES

Figure 32



Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Exposure to 1 of 4 Asthma Triggers Among Adults: Disparities

In both surveys, an estimated 40 percent of adults aged 18 and older were exposed to at least 1 of 4 asthma triggers. Exposure to 1 of 4 asthma triggers increased among adults with lifetime asthma as the age groups decreased (BRFSS 2002). This increased exposure with younger adult age groups was also observed in adults with current asthma in the RI HIS. Females with lifetime asthma reported slightly higher exposure than males, 41 percent versus 38 percent (BRFSS) with a similar pattern observed with current asthma among adults in the RI HIS. Lower SES females with lifetime asthma reported slightly higher exposure than higher SES females, 49 percent versus 41 percent (BRFSS) with similar trends observed among adults with current asthma in the RI HIS. Sample size was too small to compare males across the two SES strata.

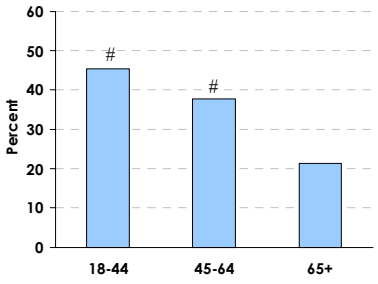
Approximately 40 percent of those without asthma reported exposure to at least one of the four triggers (BRFSS 2002).

Based on these percentages, younger age groups are more likely to be exposed to at least 1 of 4 asthma triggers than the 65 and older age group. Adults aged 18-44 with lifetime asthma old were 2.1 times more likely than 65 years and older while 45-64 year olds were 1.8 times more likely than 65 years and older (BRFSS). Similar patterns were observed among adults with current asthma in the RI HIS. Women with lifetime asthma were 1.1 times more likely than men to be exposed to at least 1 of 4 asthma triggers and lower SES women were 1.2 times more likely than their higher SES counterparts to report exposure to 1 of 4 asthma triggers (BRFSS). Similar patterns were observed among adults with current asthma in the RI HIS.

Estimated percentage of Rhode Island adults with lifetime asthma exposed to 1 of 4 triggers, by age, sex, SES, 2002. **%** **BRFSS**

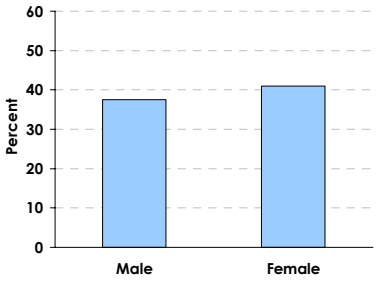
AGE

Figure 33



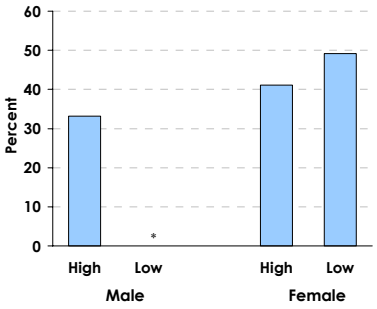
SEX

Figure 34



SES

Figure 35

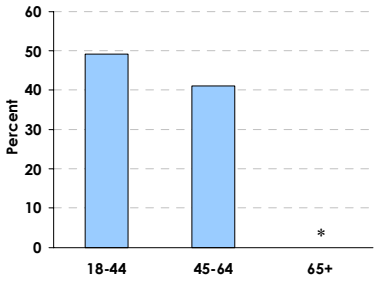


Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
\# Estimated relative risk is statistically significant (p<0.05): reference group is 65+
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Estimated percentage of Rhode Island adults with current asthma exposed to 1 of 4 triggers, by age, sex, SES, 2001. **%** **HIS**

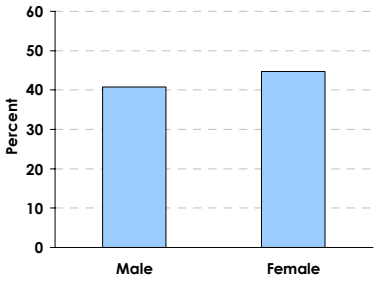
AGE

Figure 36



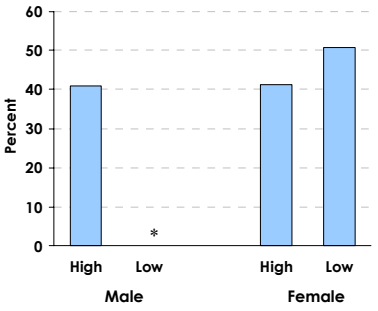
SEX

Figure 37



SES

Figure 38



Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Tobacco Use

Individuals with asthma who smoke are at increased risk for exacerbations and diminished quality of life. Identifying the prevalence of smoking among those with asthma aids in targeting public health interventions and campaigns to people with asthma who currently smoke or might consider smoking. Data presented show tobacco use status of current smokers among adults 18 and older with lifetime asthma from the BRFSS 2002, current asthma from the RI HIS 2001, and lifetime asthma among children in grades 6-8 and 9-12 from the YTS 2003.

Survey Questions: Adults

Smoking status was determined for adults aged 18 and older from the BRFSS 2002

- Not at risk = Respondents who have smoked at least 100 cigarettes in their lifetime or those who have smoked 100 cigarettes in their lifetime but do not currently smoke
- At risk = Respondents who have smoked at least 100 cigarettes in their lifetime and now smoke

Smoking status was determined for adults aged 18 and older from the RI HIS 2001 question

- Do you or anyone smoke now

Smoking Status Among Adults: Burden

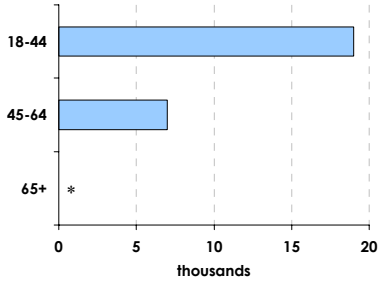
In Rhode Island, an estimated 28,205 number of adults aged 18 and older with lifetime asthma smoke tobacco (BRFSS). Younger age groups and women constitute a larger portion of this estimated total compared to older age groups and men respectively (BRFSS).

An estimated 11,338 adults with current asthma reported smoking (RI HIS). As observed with lifetime asthma, a greater number of estimated younger adults and females reported smoking compared to older age groups and males respectively. The estimated fewer number of adults who smoke observed in the RI HIS is in part due to the different asthma measures, lifetime versus current, and may in part reflect the different data collection methods used (see methods section).

Estimated number of Rhode Island adults (in 1000's) with lifetime asthma who smoke by age, sex, SES, 2002. **# (1000s)** **BRFSS**

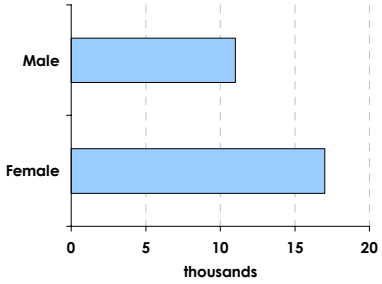
AGE

Figure 39



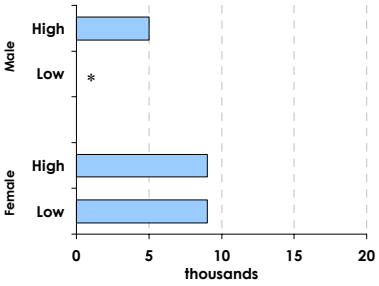
SEX

Figure 40



SES

Figure 41

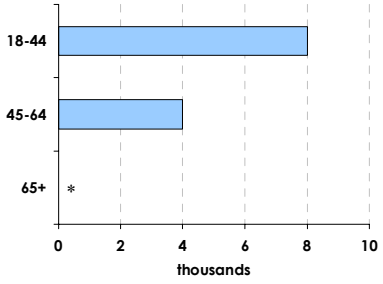


Source: Behavioral Risk Factor Surveillance, 2002. Based on 2002 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Estimated number of Rhode Island adults (in 1000's) with current asthma who smoke by age, sex, SES, 2001. **# (1000s)** **HIS**

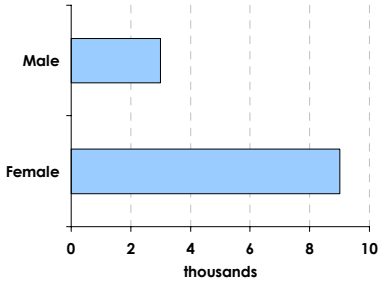
AGE

Figure 42



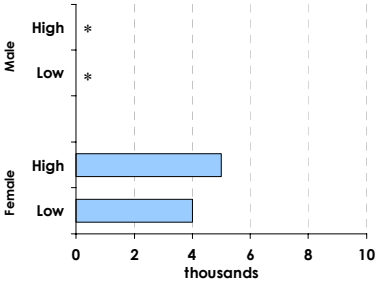
SEX

Figure 43



SES

Figure 44



Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Smoking Status Among Adults: Disparities

An estimated 27.3 percent adults aged 18 and older with lifetime asthma reported smoking in the BRFSS while an estimated 19.7 percent with current asthma reported smoking in the RI HIS. Younger adults with lifetime asthma, 18-44, reported greater prevalence of smoking than 45-64 year olds, 33 percent versus 24 percent (BRFSS 2002); a similar pattern was observed among adults with current asthma in the RI HIS. Males and females with lifetime asthma reported similar smoking prevalence in the BRFSS yet females with current asthma reported a higher smoking prevalence compared to men in the RI HIS. This disagreement between the two surveys may in part be attributed to the different asthma categories, lifetime versus current, and/or the different data collection methods used in the two surveys. Lower SES women reported a higher prevalence of smoking compared to higher SES women in both surveys.

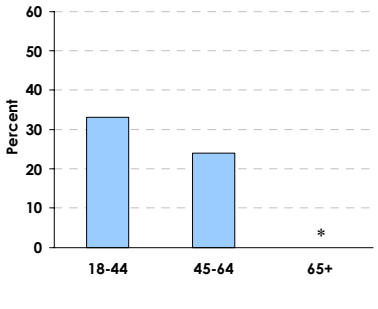
In comparison, an estimated 21.7 percent (BRFSS 2002) and 19.9 percent (RI HIS 2001) of adults aged 18 and older without asthma reported smoking.

Based on these estimated percentages, 18-44 year olds with lifetime asthma were 1.4 times more likely to report smoking than 65 years and older (BRFSS 2002). Similar patterns were observed in the RI HIS among those with current asthma. Females with lifetime asthma were nearly equally as likely, 1.0 times compared to males (BRFSS 2002). In the RI HIS, females with current asthma were 1.5 times more likely than males to report smoking. Lower SES women with lifetime asthma were 1.6 times more likely to report smoking than men (BRFSS 2002). A similar pattern was observed in the RI HIS among adults with current asthma.

Estimated percentage of Rhode Island adults with lifetime asthma who smoke, by age, sex, SES, 2002. **%** **BRFSS**

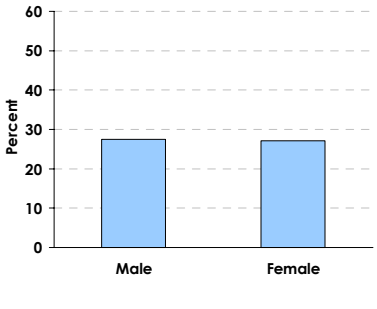
AGE

Figure 45



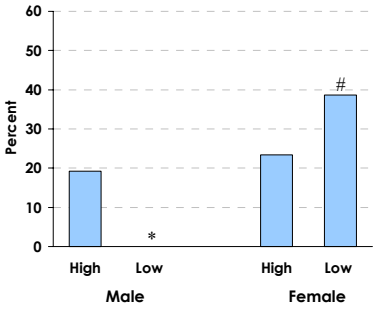
SEX

Figure 46



SES

Figure 47

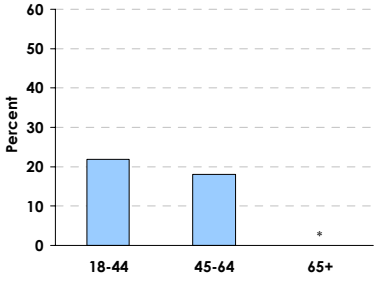


Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
# Estimated relative risk is statistically significant (p<0.05): reference group is higher SES female
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Estimated percentage of Rhode Island adults with current asthma who smoke, by age, sex, SES, 2001. **%** **HIS**

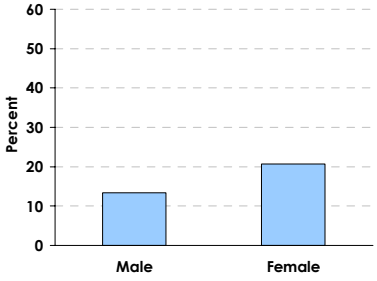
AGE

Figure 48



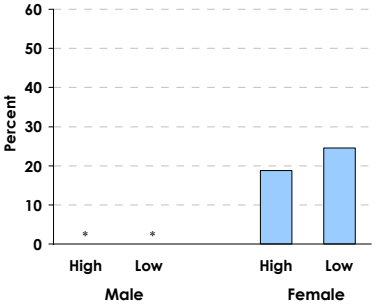
SEX

Figure 49



SES

Figure 50



Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Survey Questions: Children

Data are presented for tobacco use among children grades 6-8 and 9-12 with lifetime asthma for the YTS 2003. Similar data are not presented for the RI HIS 2001 due to insufficient sample size.

Smoking status was determined from the YTS 2003 questions that identified those who are current smokers

- During the past 30 days, on how many days did you smoke cigarettes

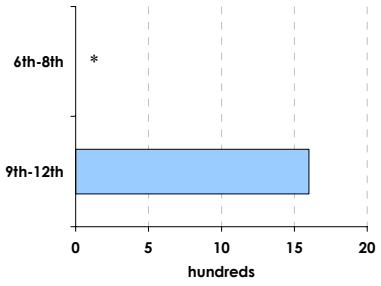
Smoking Status Among Children: Burden

An estimated 1,613 children with lifetime asthma in grades 9 through 12 reported smoking. Insufficient sample size for RI HIS data on children with asthma and smoking status. Data for children with lifetime asthma for grades 6 through 8 are not shown due to data instability.

Estimated number (in 100's) of Rhode Island children with lifetime asthma who smoke by grade and sex, 2003. **# (100s)** **YTS**

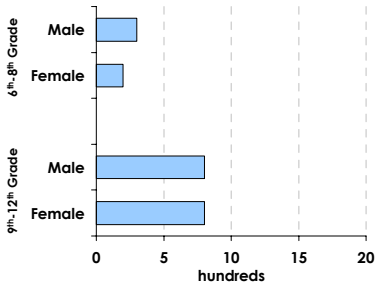
AGE

Figure 51



SEX

Figure 52



SES

DNA$^{\Omega}$

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
$^{\Omega}$ Data not available

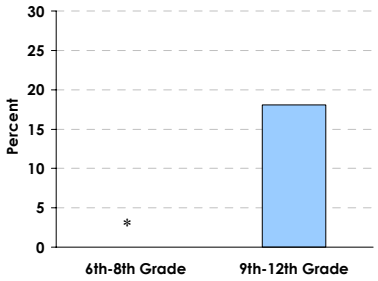
Smoking Status Among Children: Disparities

An estimated 17 percent of children in grades 9 through 12 with lifetime asthma reported smoking. This 17 percent held true for both males and females. Data for children with lifetime asthma for grades 6 through 8 are not shown due to data instability.

Estimated percentage of Rhode Island children with lifetime asthma who smoke by grade and sex, 2003. **%** **YTS**

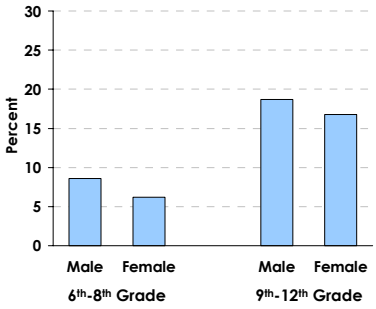
AGE

Figure 53



SEX

Figure 54



SES

DNA[Ω]

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
Ω Data not available

Environmental Tobacco Smoke (ETS)

ETS is considered both a cause and trigger of asthma, its presence in confined areas posing a major public health concern (Cloutier, Wakefield, Hall, Bailit, 2002). The health benefit associated with reduced exposure to ETS is apparent by its presence in Healthy People 2010 and Healthy Rhode Islanders 2010. Individuals with and without asthma benefit from ETS absence. However, these benefits hold unique consideration for those with asthma as ETS often triggers exacerbations potentially leading to asthma attacks, emergency room visits, or hospitalizations.

Survey Questions: Adults

The BRFSS 2002, the RI HIS 2001, and the YTS 2003 furnish population data on tobacco triggers.

Exposure to tobacco smoke was determined for adults aged 18 and older with lifetime asthma based on the response to the BRFSS 2002 question

- Does anyone smoke regularly inside your house or apartment

Exposure to tobacco smoke was determined for adults aged 18 and older with current asthma based on the response to the RI HIS 2001 question

- Which statement best describes the rules about smoking inside your home

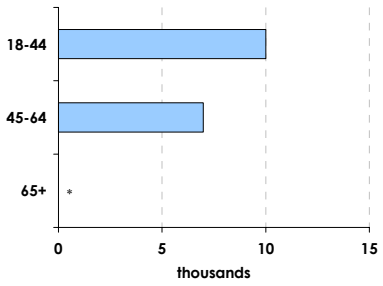
Exposure to ETS Among Adults With Asthma: Burden

In Rhode Island, an estimated 18,493 adults 18 and older with lifetime asthma reported exposure to ETS (BRFSS 2002) with females constituting a larger portion of that total compared to men. An estimated 11,338 adults with current asthma reported exposure to ETS with a similar pattern between males and females as observed in the BRFSS. The estimated number is less than the BRFSS in part due to fewer adults have current asthma and in part may be due to the different methodologies used in the surveys (see Method section, page 10). In both surveys younger adults aged 18-45 reported greater exposure to ETS than 45-64 year olds.

Estimated number of Rhode Island adults (in 1000's) with lifetime asthma exposed to ETS by age, sex, SES, 2002. **# (1000s) BRFSS**

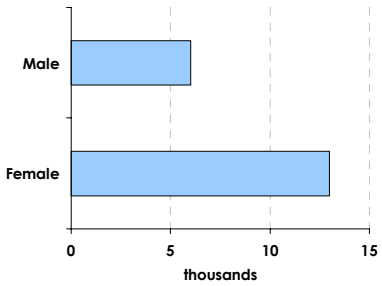
AGE

Figure 55



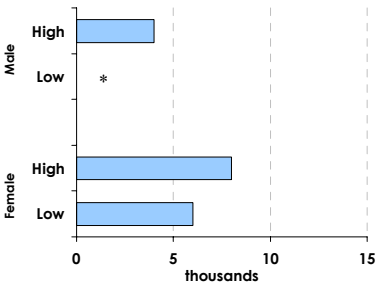
SEX

Figure 56



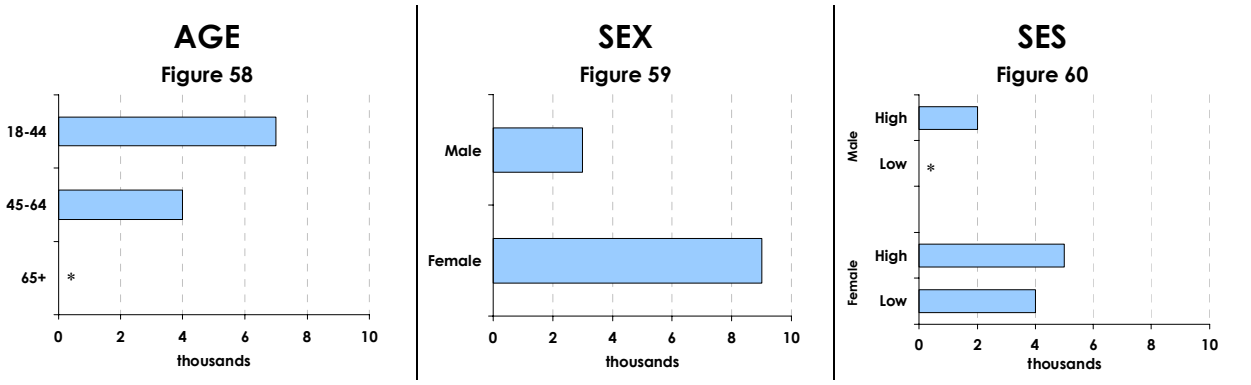
SES

Figure 57



Source: Source: Behavioral Risk Factor Surveillance, 2000. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to ETS by age, sex, SES, 2001. **# (1000s)** **HIS**



Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Exposure to ETS Among Adults With Asthma: Disparity

In both surveys, an estimated 18 percent adults aged 18 and older with lifetime asthma (BRFSS) and 18 percent with current asthma (RI HIS) reported exposure to ETS in the home. An estimated 16.6 percent of 18-44 year olds and 22.3 percent of 45-64 year olds with lifetime asthma reported exposure to ETS (BRFSS 2002). The direction of this difference between the two age groups was reversed in the RI HIS, 20.1 percent among 18-44 year olds with current asthma compared to 18.4 percent among 45-64 year olds (RI HIS 2001). In both surveys, approximately 20 percent of females reported ETS exposure compared to 15 percent among males. Lower SES females, 24.6 percent, reported exposure to ETS compared to 19.6 percent among higher SES women (BRFSS 2002). In the RI HIS, both lower and higher SES females with current asthma reported similar exposure to ETS, 21 percent.

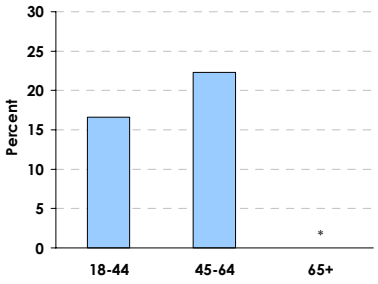
In comparison, adults aged 18 and older without asthma reported exposure to smoke in the home at 16.9 percent in the BRRFSS, and in the RI HIS was 19.9 percent.

Based on these percentages, 18-44 year olds with lifetime asthma were 0.74 times as likely to report exposure to ETS than 45-64 year olds (BRFSS 2002). A similar difference between age groups was observed among adults with current asthma in the RI HIS. Females with lifetime asthma were 1.3 times more likely than males to be exposed to ETS (BRFSS 2002). A similar pattern occurred between males and females with current asthma in the RI HIS. Lower SES females with lifetime asthma were 1.3 times more likely to be exposed to ETS than their higher SES counterparts (BRFSS 2002). A similar pattern occurred between lower SES and higher SES females with current asthma in the RI HIS.

Estimated percentage of Rhode Island adults with lifetime asthma exposed to ETS, by age, sex, SES, 2002. **%** **BRFSS**

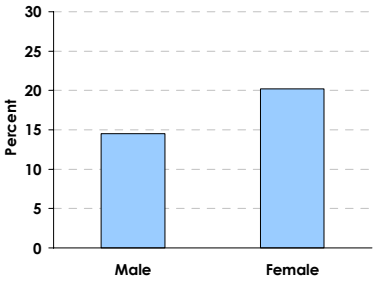
AGE

Figure 61



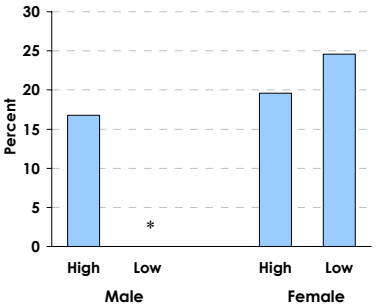
SEX

Figure 62



SES

Figure 63

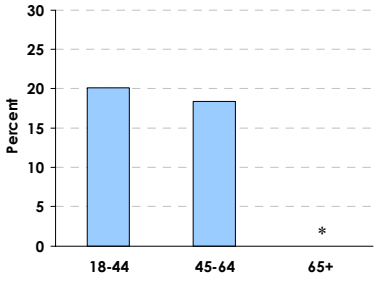


Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Estimated percentage of Rhode Island adults with current asthma exposed to ETS, by age, sex, SES, 2001. **%** **HIS**

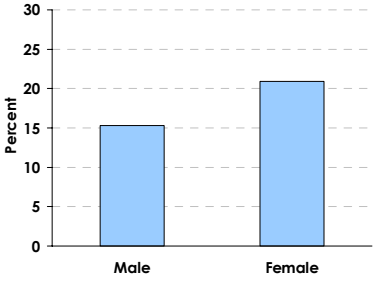
AGE

Figure 64



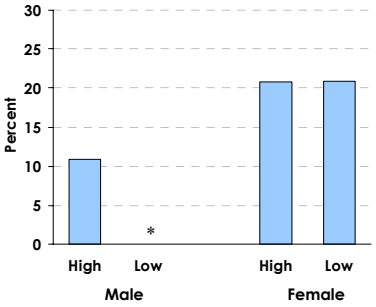
SEX

Figure 65



SES

Figure 66



Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Survey Questions: Children

Exposure to environmental smoke among children with lifetime asthma from the YTS and current asthma in the RI HIS was determined from the YTS 2003 and the RI HIS 2001.

Exposure to environmental tobacco smoke was determined for children grades 6-8 and 9-12 with lifetime asthma from the YTS 2003

- Does anyone regularly smoke cigarettes in your house or apartment

Exposure to tobacco smoke was determined for children aged 0-17 with current asthma based on the response to the RI HIS 2001 question

- Which statement best describes the rules about smoking inside your home

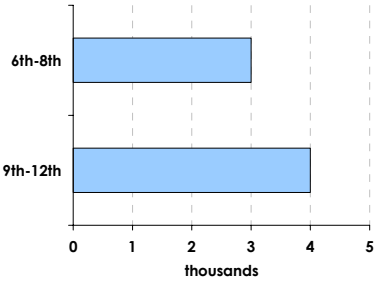
Exposure to ETS Among Children with Asthma: Burden

An estimated 2853 children in grades 6-8 with lifetime asthma were exposed to ETS and upwards to 3696 children in grades 9-12 were exposed to ETS. Males in grades 9-12 comprise the largest share of this total.

Estimated number (in 1000's) of Rhode Island children with lifetime asthma exposed to ETS by grade and sex, 2003. **# (1000s)** **YTS**

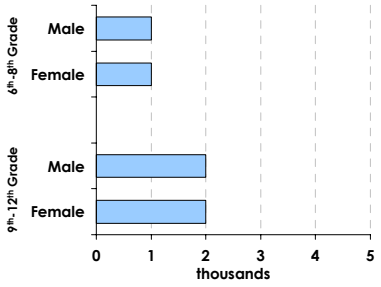
AGE

Figure 67



SEX

Figure 68



SES

DNA$^{\Omega}$

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
$^{\Omega}$ Data not available

According to the RI HIS 2001, an estimated 3,109 children aged 0-17 with current asthma were exposed to ETS 2001. Data by sex are not displayed due to insufficient sample size.

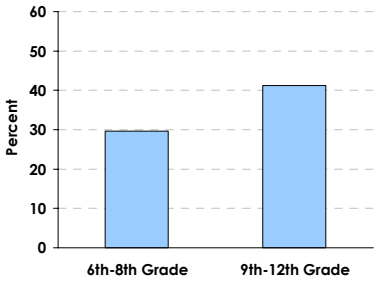
Exposure to ETS Among Children with Asthma: Disparities

Children in grades 9-12 with lifetime asthma reported a higher percent of exposure to ETS compared to their 6-8 grade counterparts, slightly over 41 percent compared to 30 percent. Very small percent differences were observed between the sexes within the two educational groups.

Estimated percentage of Rhode Island children with lifetime asthma exposed to ETS by grade and sex, 2003. **%** **YTS**

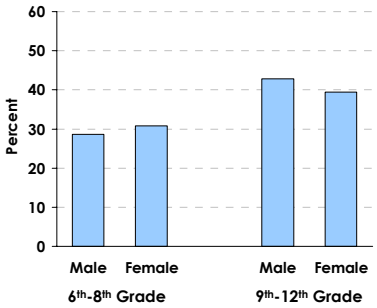
AGE

Figure 69



SEX

Figure 70



SES

DNS*

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

An estimated 12.6 percent of children aged 0-17 with current asthma were exposed to ETS according to the RI HIS 2001. Data by sex are not displayed due to insufficient sample size.

Damp Housing and Mold Conditions

The presence of indoor dampness and mold are universal problems receiving increasingly more attention as noteworthy public health challenges in efforts to create asthma-friendly environments. Several studies report increases in both prevalence and exacerbations of asthma among individuals who report damp housing conditions, in particular, the presence of mold, mildew and musty smell (Ren, Jankun, Bleanger, Leaderer, 2001; Gent, et al., 2002; Jaakkola et al., 2002). Although problematic even in cool climates, they thrive in moist environments and travel through the air (Jaakkola et al., 2002).

Survey Questions

The prevalence of exposure to damp housing for individuals with lifetime asthma (BRFSS), current asthma (RI HIS), and without asthma (BRFSS) was determined from the BRFSS 2002 and RI HIS 2001.

Exposure among adults aged 18 and older with lifetime asthma to damp housing and mildew conditions was determined based on the BRFSS 2002 questions

- During the past 12 months has there been water or dampness in the house/apartment where you lived caused by broken pipes, leaks, heavy rain, or floods
- Does the house/apartment where you live frequently have a mildew house or musty smell

Exposure among adults aged 18 and older with current asthma to damp housing and mildew conditions was determined based on the RI HIS 2001 questions

- During the past 12 months, has there been water or dampness in the apartment/house where you lived caused by broken pipes, leads, heavy rain, or floods
- Does the apartment/house where you live frequently have a mildew odor or musty smell

Exposure to Damp Housing Among Adults with Asthma: Burden

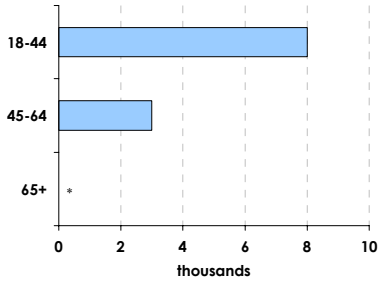
An estimated 11,675 Rhode Island adults 18 and older with lifetime asthma were exposed to home dampness (BRFSS 2002) with similar results observed in the RI HIS among those with current asthma. In both surveys, younger adult age groups compared to 65 and older constituted a greater amount of the estimated total. Females with current asthma comprised a greater proportion of the total than males (RI HIS).

Estimated number of Rhode Island adults (in 1000's) with lifetime asthma exposed to home dampness by age, sex, SES, 2002.

 # (1000s) **BRFSS**

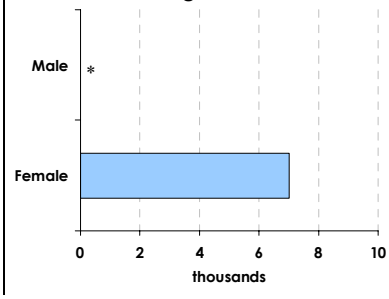
AGE

Figure 71



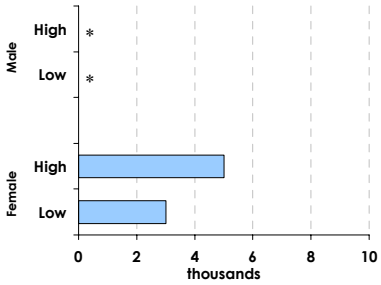
SEX

Figure 72



SES

Figure 73



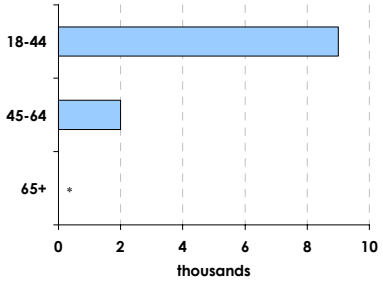
Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to home dampness by age, sex, SES, 2001.

 # (1000s) **HIS**

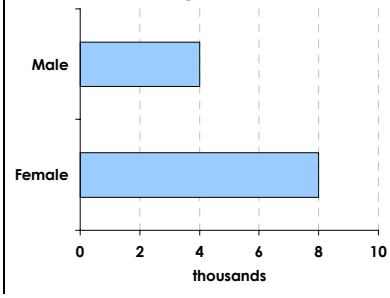
AGE

Figure 74



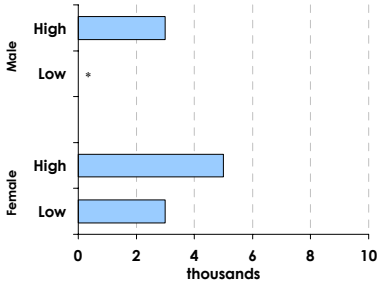
SEX

Figure 75



SES

Figure 76



Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Exposure to Damp Housing Among Adults with Asthma: Disparities

An estimated 11 percent adults with lifetime asthma (BRFSS 2002), and 18 percent with current asthma (RI HIS), reported exposure to dampness in the home. Fourteen percent of 18-44 year olds with lifetime asthma compared to 10 percent of 65 years and older reported exposure to dampness in the home (BRFSS 2002). A larger difference between the two age groups with current asthma was observed in the RI HIS, 25 percent versus 10 percent (RI HIS 2001). Females and males with current asthma reported similar exposure to dampness in the home, 18 percent (RI HIS 2001). Comparisons between males and females could not be made in the BRFSS 2002 due to data instability. Lower SES and higher SES females with lifetime asthma reported similar exposure to home dampness, 12 percent (BRFSS 2002). In the RI HIS, this measure between lower and higher SES females with current asthma was 15.7 percent versus 20 percent respectively (RI HIS 2001).

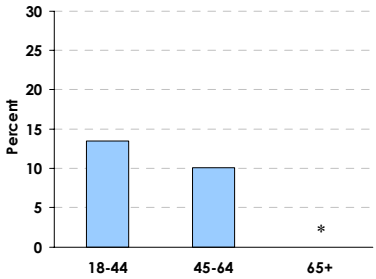
In comparison, 8.8 percent and 16.8 percent of individuals without asthma reported exposure to home dampness in the BRFSS and RI HIS respectively.

Based on these estimated percentages, 18-44 years olds with lifetime asthma were 1.3 times more likely than 65 years and older to be exposed to dampness in the home (BRFSS 2002). The exposure by age in the RI HIS reveals 18-44 year olds with current asthma were 2.7 times more likely than 65 years and older (RI HIS 2001). Women with current asthma were 1.4 times more likely than men to be exposed to home dampness (RI HIS 2001). In both surveys, lower SES females were 1.0 times as likely as higher SES females to be exposed to home dampness.

Estimated percentage of Rhode Island adults with lifetime asthma exposed to home dampness, by age, sex, SES, 2002. **%** **BRFSS**

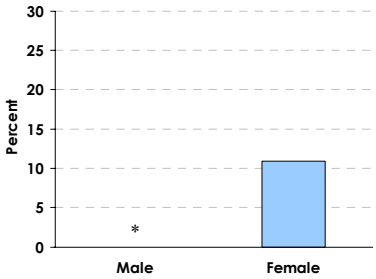
AGE

Figure 77



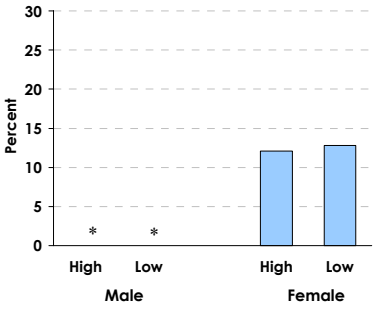
SEX

Figure 78



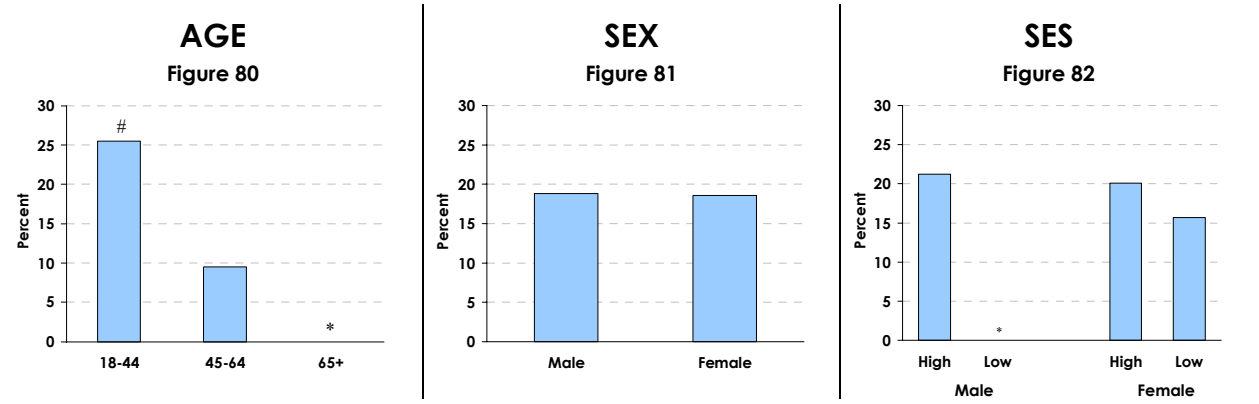
SES

Figure 79



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Estimated percentage of Rhode Island adults with current asthma exposed to home dampness, by age, sex, SES, 2001. **%** **HIS**



Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
# Estimated relative risk is statistically significant (p<0.05): reference group is 65+
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Exposure to Damp Housing Among Children with Current Asthma

In the RI HIS (2001), an estimated 7,970 children aged 0-17 with current asthma were exposed to damp housing. An estimated 32.2 percent of children aged 0-17 were exposed to damp housing .

Exposure to Home Mildew Among Adults with Asthma: Burden

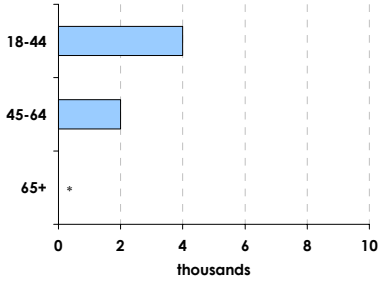
In Rhode Island, an estimated 7,025 adults 18 and older with lifetime asthma were exposed to home mildew (BRFSS 2002). Slightly higher estimates were found in the RI HIS 2001 where an estimated 8,161 adults with current asthma reported exposure to home mildew. The differences observed between the two surveys in part may be due to the different survey methods.

Estimated number of Rhode Island adults (in 1000's) with lifetime asthma exposed to home mildew by age, sex, SES, 2002.

 # (1000s) BRFSS

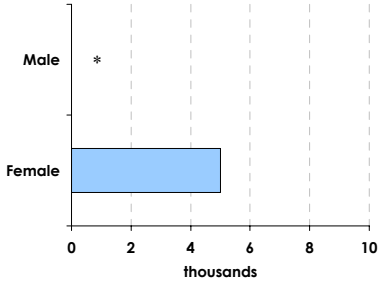
AGE

Figure 83



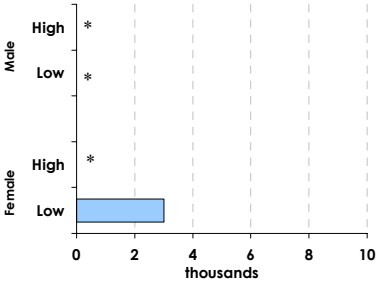
SEX

Figure 84



SES

Figure 85



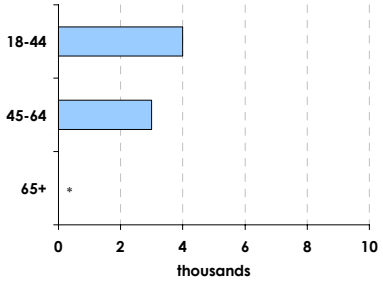
Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%.

Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to home mildew by age, sex, SES, 2001.

 # (1000s) HIS

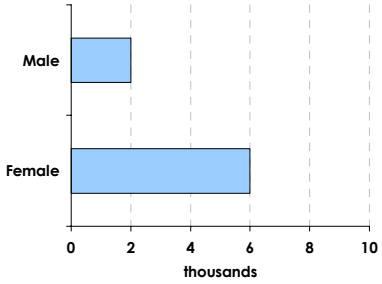
AGE

Figure 86



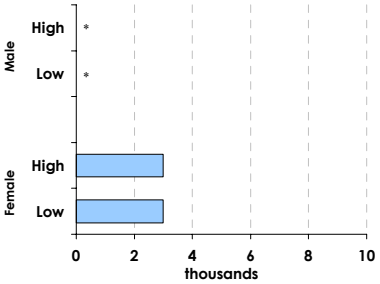
SEX

Figure 87



SES

Figure 88



Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Exposure to Home Mildew Among Adults with Asthma: Disparities

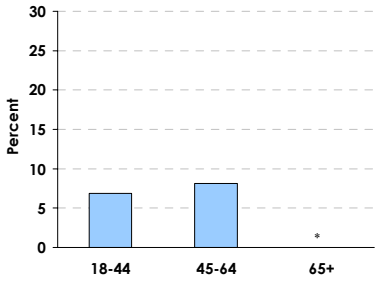
The estimated exposure to home mildew among adults aged 18 and older with lifetime asthma was 6 percent (BRFSS 2002). Thirteen percent of adults with current asthma reported exposure to mildew in the home (RI HIS). The magnitude of this difference in part may be due to the different asthma categories and/or the different methods in data collection between the two surveys (see method section). Exposure to home mildew between 18-44 and 45-64 year olds with lifetime asthma was similar, 7 percent and 8 percent respectively (BRFSS 2002). The magnitude between the these same two age groups with current asthma was slightly greater in the RI HIS, 12 percent and 16 percent (RI HIS 2001). Fourteen percent of females and 11 percent of males with current asthma reported exposure to home mildew (RI HIS 2001). An estimated 17 percent of lower SES females compared to 13 percent of higher SES females with current asthma reported exposure to mildew in the home (RI HIS 2001).

Based on these percentages, 18-44 year olds with lifetime asthma were 0.8 times as likely to be exposed to mildew in the home compared to 45-64 year olds (BRFSS 2002). A similar relative risk was observed in the RI HIS among adults with current asthma. Females with current asthma were 1.4 times more likely than males to be exposed to mildew in the home and among females, lower SES females were 1.3 times more likely than higher SES females to be exposed to mildew in the home (RI HIS 2001). Data on these same measures were not stable in the BRFSS 2002.

Estimated percentage of Rhode Island adults with lifetime asthma exposed to home mildew, by age, sex, SES, 2002. **%** **BRFSS**

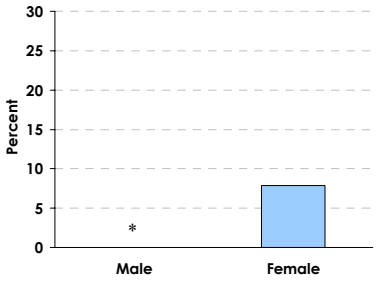
AGE

Figure 89



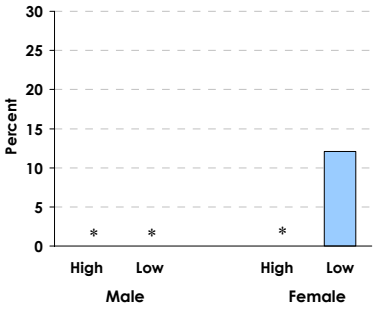
SEX

Figure 90



SES

Figure 91

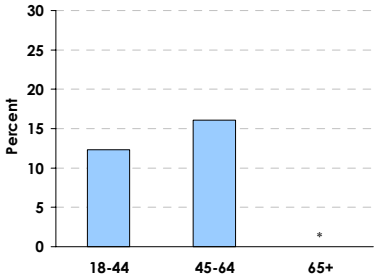


Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%.

Estimated percentage of Rhode Island adults with current asthma exposed to home mildew, by age, sex, SES, 2001. **%** **HIS**

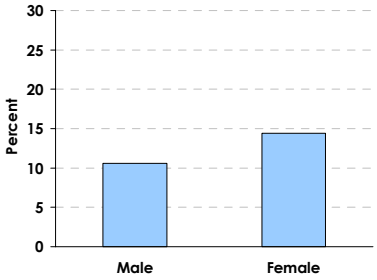
AGE

Figure 92



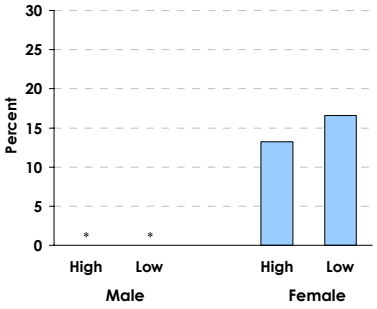
SEX

Figure 93



SES

Figure 94



Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Exposure to Home Mildew Among Children with Current Asthma

In the RI HIS (2001), an estimated 4,901children aged 0-17 with current asthma were exposed to home mildew. This translates into an estimated 19.8 percent of children aged 0-17 with current asthma exposed to home mildew.

Flu Shots

Respiratory infections, particularly rhinoviruses which include influenza, are strongly associated with exacerbations of asthma, leading to morbidity and mortality (Ford, Mannino, Williams, 2003; Johnston, et al., 1995). Some studies suggest a relationship between respiratory infection during gestation and childhood asthma (16) (Hughes, Jones, Wright, Dobbs, 1999). Significant reductions in morbidity and mortality accompanying influenza can be achieved through influenza vaccinations (Kramarz, DeStefano, Garguillo, 2001). Both the CDC and the National Asthma Education and Prevention Program guidelines recommend annual vaccinations for those with asthma (Hughes et al., 1999; NHLB, 1997).

Survey Question: Adults

Immunization status among adults aged 18 and older with lifetime asthma was determined based on the BRFSS 2002 questions

- During the past 12 months, have you had a flu shot

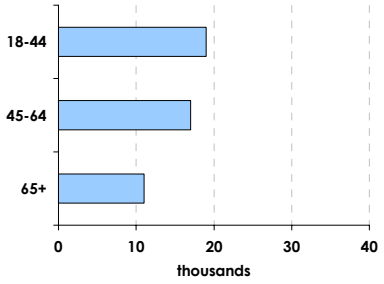
Flu Shots Among Adults with Asthma: Burden

In Rhode Island, an estimated 46,285 adults 18 and older with lifetime asthma received a flu shot (BRFSS 2002) with fewer men reporting flu shots compared to their female counterparts.

Estimated number of Rhode Island adults (in 1000's) with lifetime asthma received flu shot by age, sex, SES, 2002. **# (1000s)** **BRFSS**

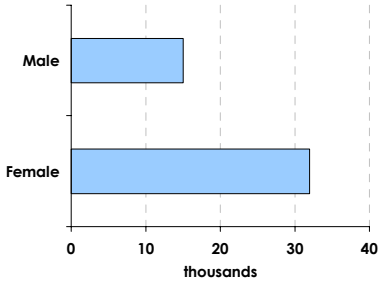
AGE

Figure 95



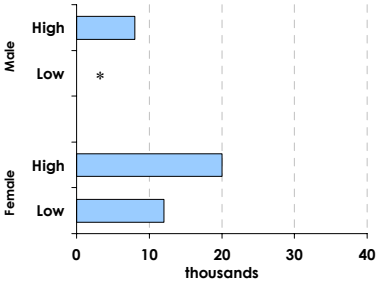
SEX

Figure 96



SES

Figure 97



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Flu Shots Among Adults with Asthma: Disparities

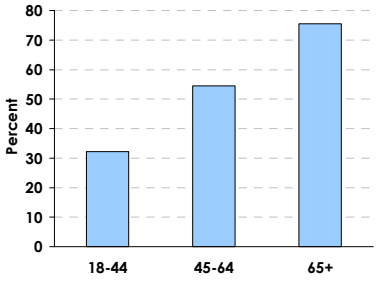
An estimated 45 percent of adults aged 18 and older with lifetime asthma received an annual flu shot. The age group 18-44 reported the lowest, 32 percent, followed by 45-64 year olds, 55 percent, and 76 percent of 65 years and older received a flu shot (BRFSS 2002). Lower and higher SES females with lifetime asthma reported similarly on this measure, 49 percent.

Based on these percentages, 18-44 year olds with lifetime asthma were 0.43 times as likely compared to 65 years and older to receive a flu shot, close to half as likely (BRFSS 2002). While 45-64 year olds with lifetime asthma were 0.72 times as likely to receive a flu shot compared to 65 and older (BRFSS 2002). Females with lifetime asthma were 1.4 times as likely as men, and among females, lower SES females were 1.0 times as likely to receive a flu shot (BRFSS 2002).

Estimated percentage of Rhode Island adults with lifetime asthma received flu shot, by age, sex, SES, 2002. **%** **BRFSS**

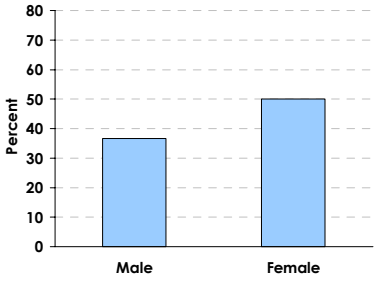
AGE

Figure 98



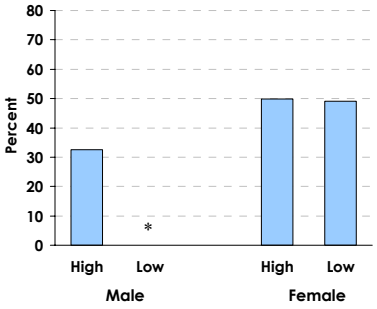
SEX

Figure 99



SES

Figure 100



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

ASTHMA CONTROL IN RHODE ISLAND

Control of asthma symptoms is core to asthma management. Uncontrolled asthma manifests itself in many dimensions ranging from urgent health care visits to ER visits, and from excessive symptoms during the day to interrupted sleep. Asthma control is reported from both the RI HIS 2001 and the BRFSS 2002 among adults with current asthma, although the survey questions differ in both type and number. The first set of data, rescue inhaler use, originates from the RI HIS 2001, the remainder of the data, day symptoms, night symptoms, emergency room visits, asthma attacks, urgent care visits and activity limitations originate from the BRFSS 2002 Adult Asthma Control Module (See appendix D for survey questions and definitions).

Rescue Inhaler Use

Survey Question

A measurement of asthma out of control among adults aged 18 and older was derived from the RI HIS 2001 survey from the question below. Rescue inhaler use greater than 2 times per week is defined as out of control asthma (See appendix D for survey questions and definitions).

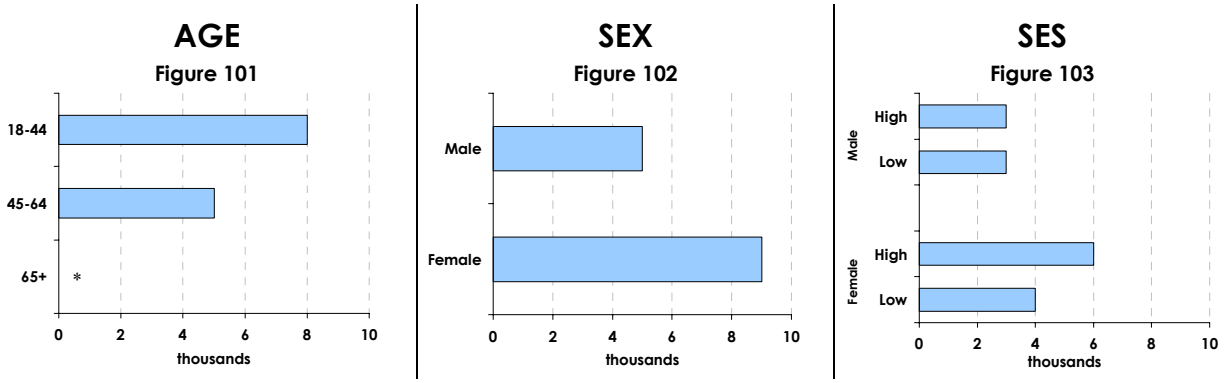
- About how often do/does individual have to use a rescue inhaler

Rescue Inhaler Use Among Adults: Burden

In Rhode Island, an estimated 14,142 adults 18 and older with current asthma reported rescue inhaler use greater than 2 times per week.

Estimated number of Rhode Island adults (in 1000's) with current asthma and rescue inhaler use greater than 2x/week by age, sex, SES, 2001.

 # (1000s) **HIS**



Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Rescue Inhaler Use Among Adults: Disparities

Approximately 23 percent of adults aged 18 and older with current asthma reported uncontrolled asthma, defined as inhaler use greater than 2 times per week (RI HIS 2001). An estimated 26 percent of 45-64 year olds and 22 percent of 18-44 year olds reported rescue inhaler use greater than 2 times per week (RI HIS 2001). Stated differently, close to 25 percent of adults with asthma report symptoms of uncontrolled asthma. Similar rescue inhaler use was found between females and males, approximately 23 percent (RI HIS 2001). Among females, lower SES reported 24 percent rescue inhaler use compared to 21 percent among higher SES (RI HIS 2001).

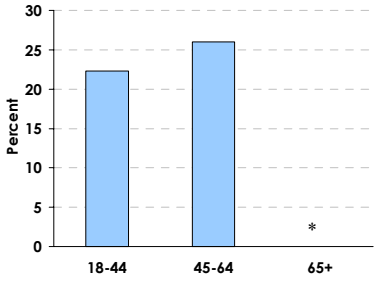
Based on these estimated percentages, 18-44 year olds with current asthma were 0.9 times as likely as 45-64 year old to use a rescue inhaler greater than 2 times per week (RI HIS 2001). Females were 1.0 times as likely as males to use a rescue inhaler greater than 2 times per week. On the same measure lower SES females were 1.1 times as likely as higher SES (RI HIS 2001).

Estimated percentage of Rhode Island adults with current asthma and rescue inhaler use greater than 2x/week, by age, sex, SES, 2001.

% **HIS**

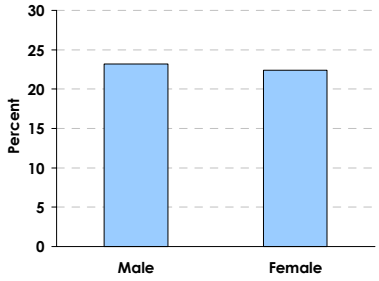
AGE

Figure 104



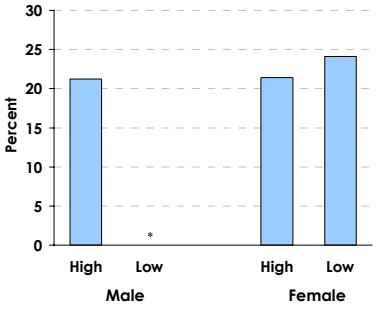
SEX

Figure 105



SES

Figure 106



Source: Weighted data from RI Health Interview Survey 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Day symptoms

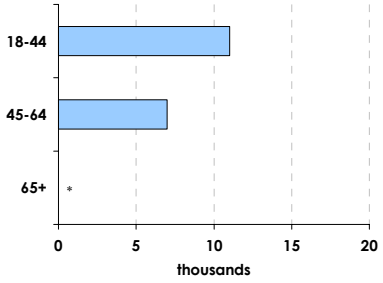
Day Symptoms: Burden

In Rhode Island, an estimated 22,168 adults 18 and older with current asthma reported day symptoms greater than 2 times per week. Behind this total, an estimated 16,808 females and 7,457 males reported day symptoms greater than 2 times per week.

Estimated number of Rhode Island adults (in 1000's) with current asthma and day symptoms by age, sex, SES, 2002. **# (1000s)** **BRFSS**

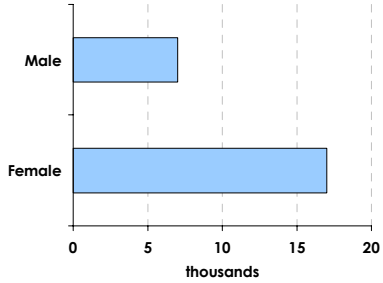
AGE

Figure 107



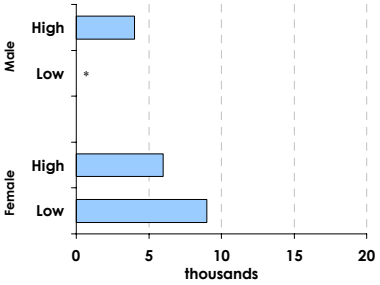
SEX

Figure 108



SES

Figure 109



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Day Symptoms: Disparities

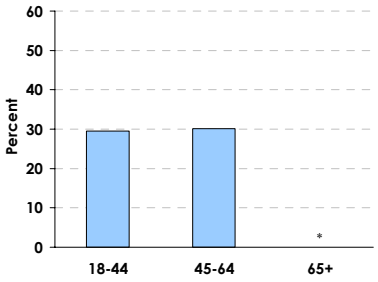
An estimated 30 percent of adults aged 18 and older experienced day symptoms greater than 2 times per week. (See appendix D for survey questions and definitions). Similar to the magnitude of the total percent, 30 percent of both 18-44 year olds and 45-64 year olds reported day symptoms greater than 2 times per week. An estimated 37 percent of females reported day symptoms compared to males, 29 percent (BRFSS 2002).

Based on these percentages, 18-44 year olds were 1.0 times as likely as 45-64 year olds to experience day symptoms greater than 2 times per week (BRFSS 2002). A similar magnitude was observed between females and males, females were 1.1 times as likely as males to experience day symptoms greater than two times per week (BRFSS 2002). The relative risk with the greatest magnitude occurred between lower SES and higher SES females, lower SES females were 2.1 times more likely to experience day symptoms greater than 2 times per week (BRFSS 2002).

Estimated percentage of Rhode Island adults with current asthma and day symptoms by age, sex, SES, 2002. **%** **BRFSS**

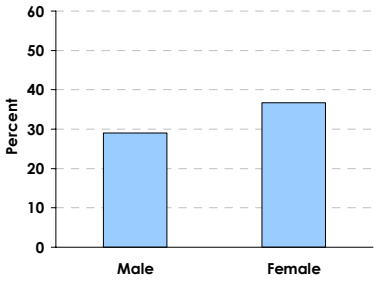
AGE

Figure 110



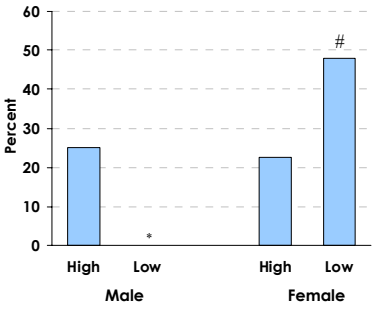
SEX

Figure 111



SES

Figure 112



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
# Estimated relative risk is statistically significant (p<0.05): reference group is higher SES females
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Night Symptoms

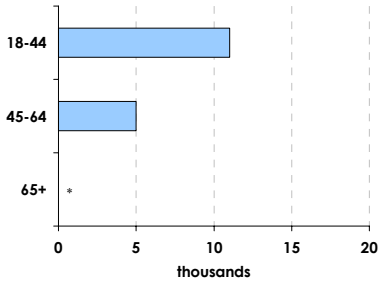
Night Symptoms: Burden

In Rhode Island, an estimated 19,816 adults 18 and older with current asthma reported night symptoms greater than 2 times per month (BRFSS 2002). By age groups, 18-44 year olds had the largest estimated number and by sex, females had the largest estimated number reporting night symptoms greater than 2 times per month (BRFSS 2002).

Estimated number of Rhode Island adults (in 1000's) with current asthma and night symptoms by age, sex, SES, 2002. **# (1000s)** **BRFSS**

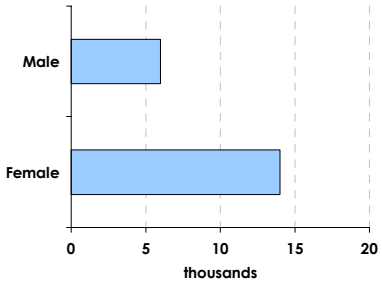
AGE

Figure 113



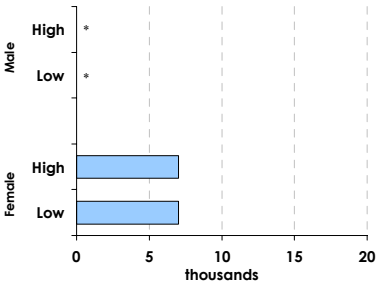
SEX

Figure 114



SES

Figure 115



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Night Symptoms Among Adults: Disparities

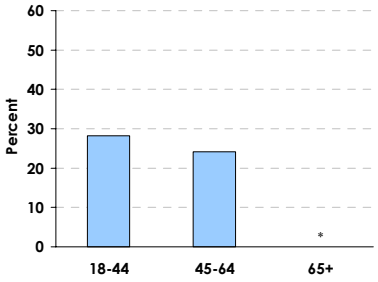
An estimated 28 percent of adult aged 18 and older with current asthma reported night symptoms greater than 2 times per month (BRFSS 2002). Among 18-44 year olds, 28 percent compared to 24 percent 45-64 year olds reported night symptoms greater than 2 times per month. An estimated 30 percent of females compared to 21 percent of males reported night symptoms greater than 2 times per month.

Based on these percentages, 18-44 year olds were 1.2 times more likely than 45-64 year olds and females were 1.4 times more likely than males to report night symptoms greater than 2 times per month. Among females, lower SES were 1.4 times more likely than higher SES to report night symptoms greater than 2 times per month (BRFSS 2002).

Estimated percentage of Rhode Island adults with current asthma and night symptoms by age, sex, SES, 2002. **%** **BRFSS**

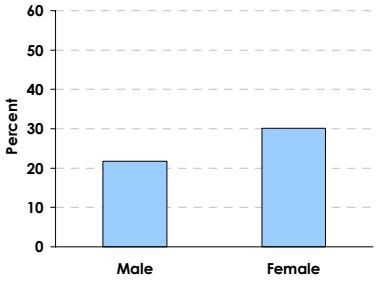
AGE

Figure 116



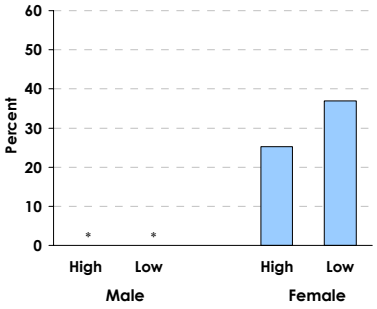
SEX

Figure 117



SES

Figure 118



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Emergency Room Visits

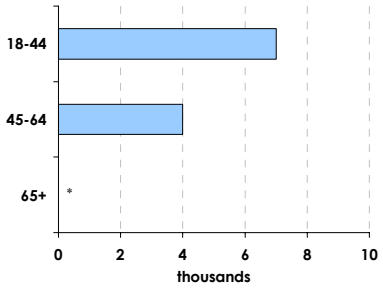
Emergency Room Visits: Burden

In Rhode Island, an estimated 12,474 adults 18 and older with current asthma reported at least 1 emergency room visit in the past 12 months (BRFSS 2002). By age groups, 18-44 year olds have the largest estimated number and by sex, females have the largest estimated number reporting at least emergency room visit in the past 12 months (BRFSS 2002).

Estimated number of Rhode Island adults (in 1000's) with current asthma and ER visits by age, sex, SES, 2002. **# (1000s)** **BRFSS**

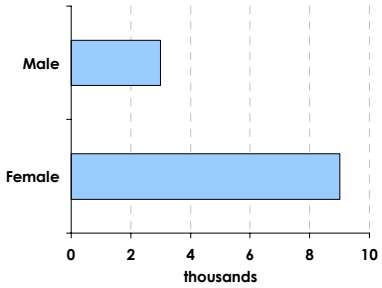
AGE

Figure 119



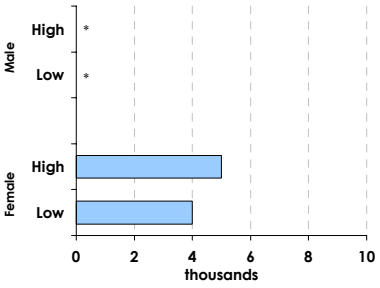
SEX

Figure 120



SES

Figure 121



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Emergency Room Visits Among Adults: Disparities

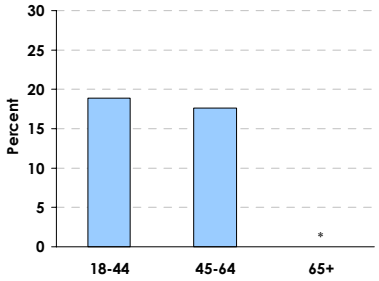
An estimated 17.5 percent of adults aged 18 and older reported at least one asthma-related emergency room (ER) visit in the past 12 months. Within that total, 18.9 percent 18-44 year olds and 17.6 percent 45-64 year olds reported an asthma related ER visit in the past 12 months. An estimated 19.2 percent of females compared to 13.6 percent males reported an asthma-related ER visit in the past 12 months (BRFSS 2002).

Based on these percentages, 18-44 year olds were 1.1 times more likely than 45-64 years olds and females were 1.4 times more likely than males to report an asthma-related ER visit in the past 12 months. Similarly, among females, lower SES were 1.4 times more likely than higher SES females to report an asthma-related ER visit in the past 12 months.

Estimated percentage of Rhode Island adults with current asthma and ER visits by age, sex, SES, 2002. **%** **BRFSS**

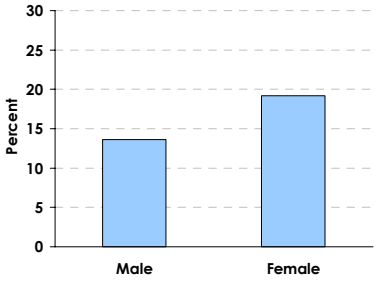
AGE

Figure 122



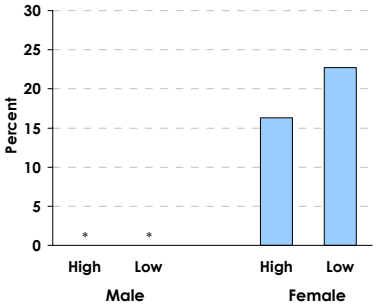
SEX

Figure 123



SES

Figure 124



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Asthma Attacks

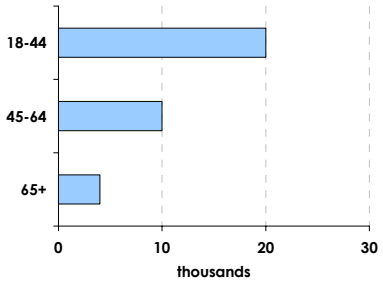
Asthma Attacks Among Adults: Burden

In Rhode Island, an estimated 33,715 adults 18 and older with current asthma reported at least 1 asthma attack in the past 12 months. By age groups, 18-44 year olds have the largest estimated number and by sex, females have the largest estimated number reporting at least 1asthma attack in the past 12 months (BRFSS 2002).

Estimated number of Rhode Island adults (in 1000's) with current asthma and asthma attacks by age, sex, SES, 2002. **# (1000s) BRFSS**

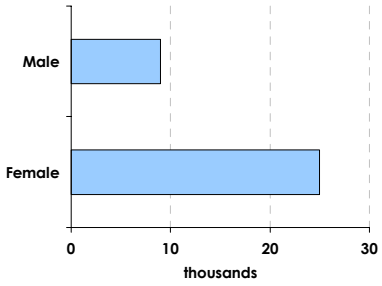
AGE

Figure 125



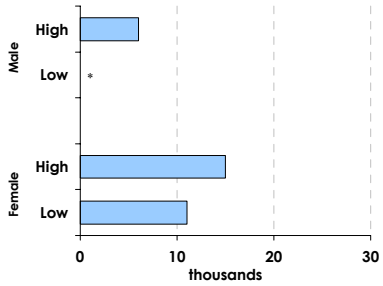
SEX

Figure 126



SES

Figure 127



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Asthma Attacks Among Adults: Disparities

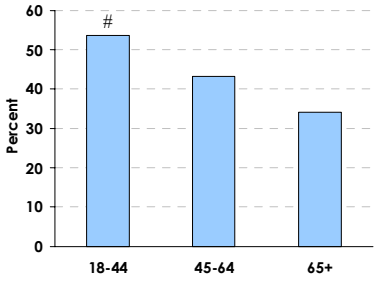
An estimated 47 percent of adults aged 18 and older with current asthma experienced at least one or more asthma attacks in the past 12 months (BRFSS 2002). Starting with the youngest of the three adult age groups, 53.7 percent, 43.3 percent, and 34.1 percent respectively, reported experiencing at least 1 asthma attack in the past 12 months. Between the sexes, 53.3 percent of females and 34.7 percent of males reported at least 1 asthma attack in the past 12 months.

Based on these percentages, 18-44 year olds were 1.6 times more likely compared to 65 and older and 45-64 year olds were 1.3 times more likely than 65 and older to report at least 1 asthma attack in the past 12 months. Females were 1.5 times more likely than males and among females, lower SES were 1.1 times more likely than higher SES to experience at least 1 asthma attack in the past 12 months.

Estimated percentage of Rhode Island adults with current asthma and asthma attacks by age, sex, SES, 2002. **%** **BRFSS**

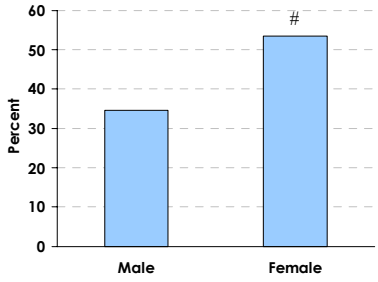
AGE

Figure 128



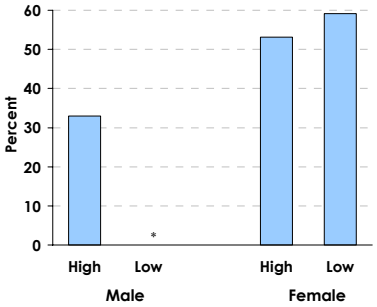
SEX

Figure 129



SES

Figure 130



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
\# Estimated relative risk is statistically significant (p<0.05): reference group is 65+; reference group is males
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Urgent Care Visits

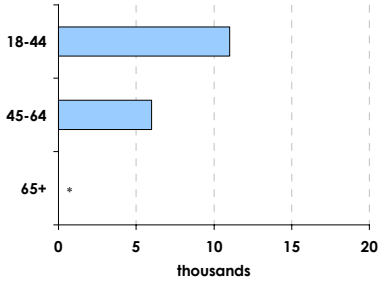
Urgent Care Visits Among Adults: Burden

In Rhode Island, an estimated 19,459 adults 18 and older with current asthma reported at least 1 urgent visit in the past 12 months. By age groups, 18-44 year olds have the largest estimated number and by sex, females have the largest estimated number reporting at least 1 urgent care visit in the past 12 months (BRFSS 2002).

Estimated number of Rhode Island adults (in 1000's) with current asthma and urgent visits by age, sex, SES, 2002. **# (1000s)** **BRFSS**

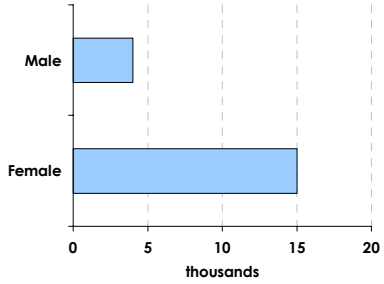
AGE

Figure 131



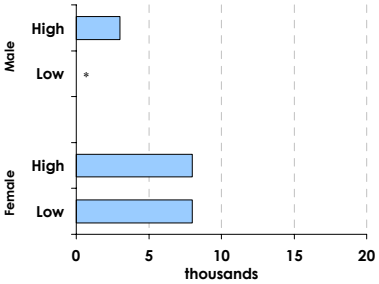
SEX

Figure 132



SES

Figure 133



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Urgent Care Visits Among Adults: Disparities

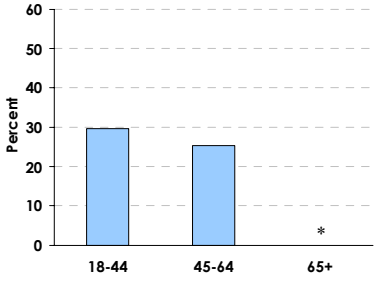
An estimated 27.3 percent of adults with current asthma reported experiencing at least 1 urgent visit in the past 12 months (BRFSS 2002). Both age groups did not move far from this total, with 29.6 percent among 18-44 year olds and 25.2 percent among 45-64 year olds. The same measures were 32.8 percent among females compared to 16.5 percent among males.

Based on these percentages, 18-44 year olds were 1.2 times more likely than 45-64 year olds to report at least 1 urgent care visit in the past 12 months. The largest magnitude was between females and males where females were 2.0 times more likely than males to report at least 1 urgent visit in the past 12 months. Lower SES females were 1.6 times more likely than higher SES females on this same measure.

Estimated percentage of Rhode Island adults with current asthma and urgent visits by age, sex, SES, 2002. **%** **BRFSS**

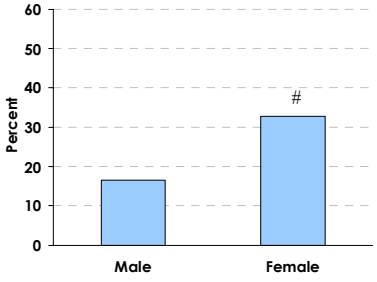
AGE

Figure 134



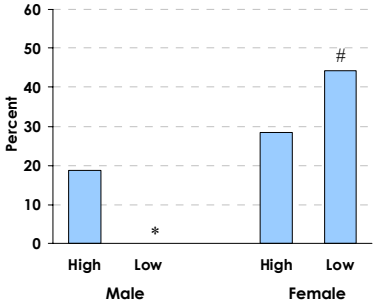
SEX

Figure 135



SES

Figure 136



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
\# Estimated relative risk is statistically significant ($p<0.05$): reference group is males; reference group is higher SES females
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

Activity Limitations Attributed To Asthma

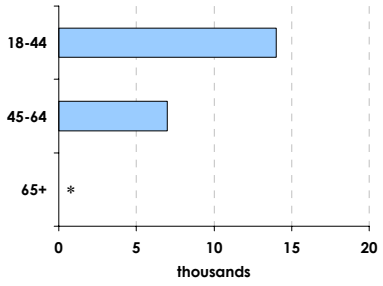
Activity Limitations Attributed to Asthma Among Adults: Burden

In Rhode Island, an estimated 24,520 adults 18 and older with current asthma reported asthma-related activity limitations in the past 12 months. By age groups, 18-44 year olds have the largest estimated number and by sex, females have the largest estimated number reporting activity limitations (BRFSS 2002).

Estimated number of Rhode Island adults (in 1000's) with current asthma and limitations by age, sex, SES, 2002. **# (1000s)** **BRFSS**

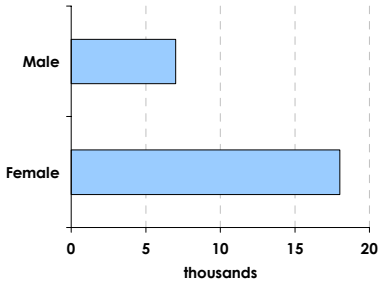
AGE

Figure 137



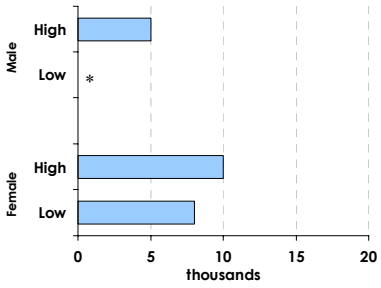
SEX

Figure 138



SES

Figure 139



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Activity Limitations Attributed to Asthma Among Adults: Disparities

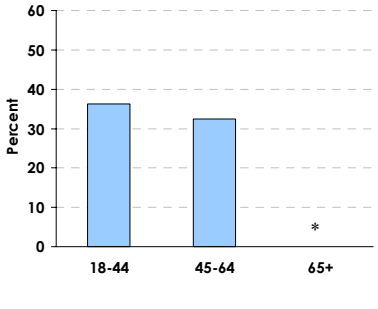
An estimated 35 percent of adults aged 18 and older with current asthma reported asthma-related activity limitations in the past 12 months (BRFSS 2002). Among 18-44 year olds 36.3 percent and among 45-64 year olds, 32.5 percent reported activity limitations. The same measure was 39.1 percent among females and 25.8 percent among males. And among females, 45.9 percent of lower SES compared to 35.9 percent of higher SES reported asthma-related activity limitations.

Based on these percentages, 18-44 year olds were 1.1 times more likely than 45-64 year olds and females were 1.5 times more likely than males to experience asthma-related activity limitations. Among females, lower SES were 1.3 times more likely than higher SES on this same measure.

Estimated percentage of Rhode Island adults with current asthma and limitations by age, sex, SES, 2002. **%** **BRFSS**

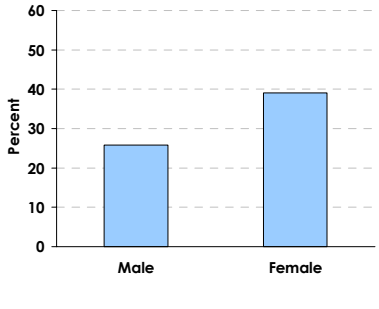
AGE

Figure 140



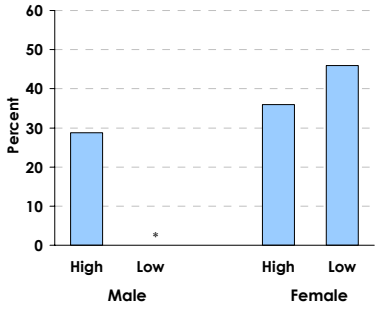
SEX

Figure 141



SES

Figure 142



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Summary Control Measure (BRFSS 2002)

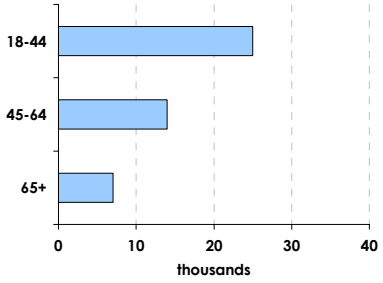
Summary Control Measure Among Adults: Burden

In Rhode Island, an estimated 45,832 adults 18 and older with current asthma reported at least 1 of the 6 asthma control measures. By age groups, 18-44 year olds have the largest estimated number and by sex, females have the largest estimated number.

Estimated number of Rhode Island adults (in 1000's) with current asthma control summary by age, sex, SES, 2002. **# (1000s) BRFSS**

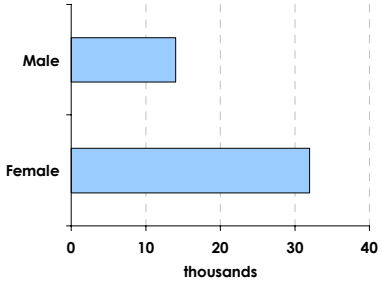
AGE

Figure 143



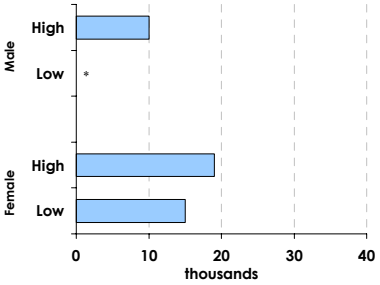
SEX

Figure 144



SES

Figure 145



Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%

Summary Control Measure Among Adults: Disparities

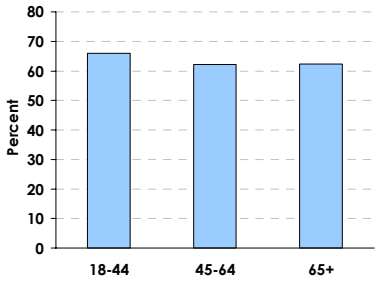
As great as 64.3 percent of adults aged 18 and older with current asthma are estimated to have reported at least 1 out of the 6 control measures, a figure that held relatively stable across age groups (BRFSS 2002). Sixty-nine percent of females and 53.4 percent of males experienced at least 1 of the 6 control measures.

Based on these percentages, 18-44 year olds were 1.1 times more likely and similarly, 45-64 year olds were 1.0 times more likely to experience at least 1 of the 6 control measures. Females were 1.3 times more likely than males, and among females, lower SES were 1.2 times more likely than higher SES to experience at least 1 of the 6 control measures.

Estimated percentage of Rhode Island adults with current asthma and control summary by age, sex, SES, 2002. **%** **BRFSS**

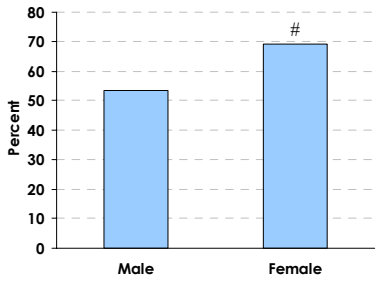
AGE

Figure 146



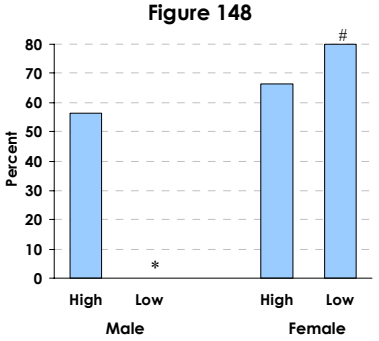
SEX

Figure 147



SES

Figure 148



Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if weighted relative standard error > 30%
\# Estimated relative risk is statistically significant ($p<0.05$): reference group is males; reference group is higher SES females
Relative risk: small is 1.2; moderate is 1.9; large is 3.0

HEDIS (The Health Plan Employer Data and Information Set)

A key practice in any asthma management plan is the prescription of appropriate asthma medication. To examine the prescription of appropriate asthma medication in Rhode Island, the HEDIS measure, "Use of Appropriate Medications for People With Asthma" was calculated. The data originates from the three primary health plans in Rhode Island.

The HEDIS data displayed are based on the measurement year 2002. The data reflects the percentage of enrolled members meeting the following criteria:

- Aged 5-56 years old with persistent asthma
- Appropriately prescribed medication during the measurement year
- Continuously enrolled in the plan during the measurement year and the year prior, a total of 24 months

Persistent asthma is defined below. Continuous enrollment is defined as enrolled in the plan without a 45-day or greater gap for the past 24 months. Appropriate use of medication prescribed is defined as an individual filling at least one asthma medication prescriped.

Two separate HEDIS measures were calculated. One measure reports the commercial and Medicaid populations separately among the three Health Plans – Blue Cross Blue Shield of Rhode Island (including Blue Chip, their managed health plan), UnitedHealthCare of New England and Neighborhood Health Plan of Rhode Island (NHPRI). The data is divided into three age groups - 5 to 9, 10 to 17, and 18 to 56 - and all ages combined.

The second calculation based on health plan enrollment is a weighted Rhode Island average calculated for the commercial and Medicaid population separately.

Persistent asthma is defined as meeting any one of the following criteria:

- At least one emergency department (ED) visit based on selected visit codes with asthma as the principal diagnosis (ICD-9 code 493)
- At least one acute inpatient discharge based on the visit selected visit codes with asthma as the principal diagnosis
- At least four outpatient asthma visits based on selected visit codes with asthma as one of the listed diagnoses and at least two asthma medication dispensing events
- At least four asthma medication dispensing events (i.e., an asthma medication was dispensed on four occasions)

The three primary health plans in Rhode Island are Blue Cross Blue Shield of Rhode Island (including Blue Chip), UnitedHealthCare of New England, and Neighborhood Health Plan of Rhode Island (NHPRI). Blue Cross Blue Shield and United HealthCare of New England constitute a large portion of the commercial members while Neighborhood Health Plan of Rhode Island and a portion of United Healthcare of New England constitute the majority of the Medicaid enrolled members presented.

<u>Appropriate Medication Prescribed</u>

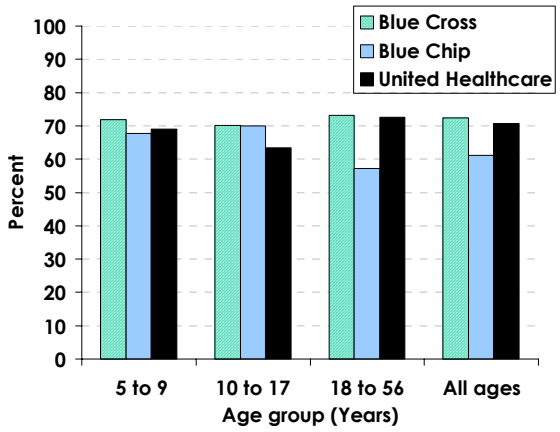
Based on the commercial and Medicaid HEDIS 2002 data from the three major health plans in Rhode Island, many Rhode Islanders with persistent asthma are prescribed appropriate asthma medication. The percentage of the commercial population appropriately prescribed asthma medication ranged from 57 percent to a high of 73 percent. The percentage of the Medicaid population appropriately prescribed asthma medication spanned from 61 percent to 70 percent.

The weighted Rhode Island average for the commercial population from the three health plans was slightly over 70 percent while just over 65 percent of Medicaid population reported prescription of appropriate asthma medication.

Appropriate Use of Medications for Commercial Population with Persistent Asthma by Health Plan and by Age Group, 2002.

% HEDIS

Figure 149

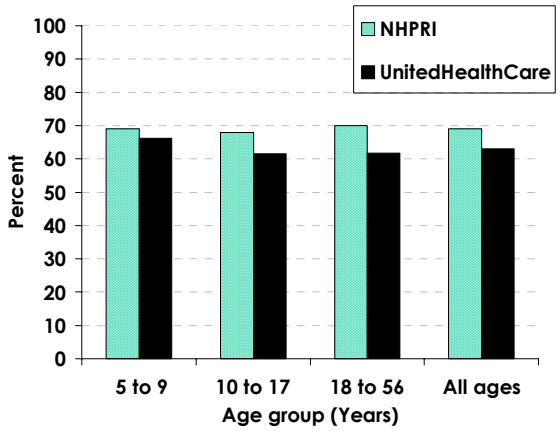


Source: HEDIS 2002. RI Blue Cross Blue Shield, United Health Care of New England

Appropriate Use of Medications for Medicaid Population with Persistent Asthma by Health Plan and by Age Group, 2002.

% HEDIS

Figure 150

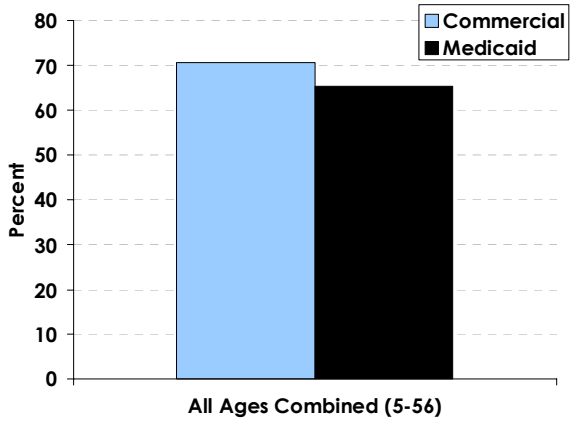


Source: HEDIS 2002. United Health Care of New England, Neighborhood Health Plan of Rhode Island

Weighted State Average Appropriate Use of Medications for People with Persistent Asthma by Health Insurance Type, 2002.

% HEDIS

Figure 151



Source: HEDIS 2002. RI Blue Cross Blue Shield of Rhode Island, UnitedHealth Care of New England, Neighborhood Plan of Rhode Island

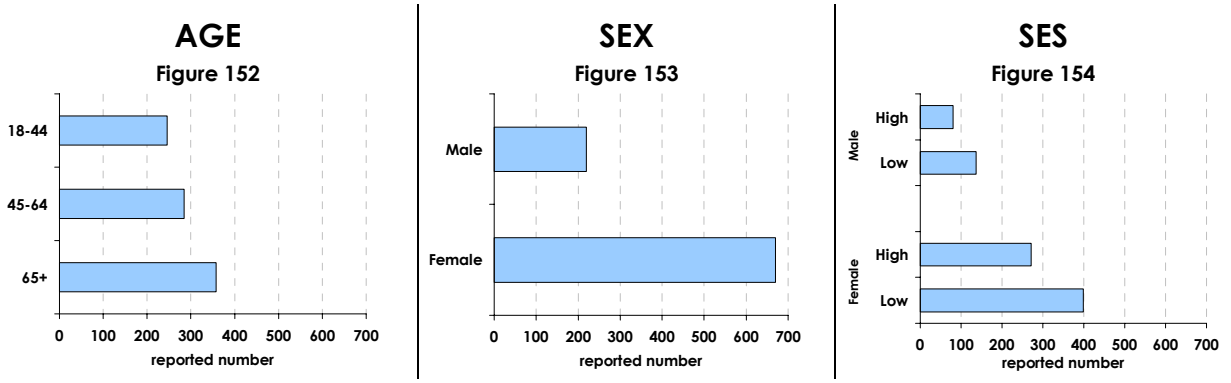
ASTHMA HOSPITALIZATIONS IN RHODE ISLAND

The Rhode Island asthma community is committed to reducing undesirable and preventable hospitalizations attributed to asthma. Such hospitalizations are accompanied by both financial and emotional costs well familiar to individuals with asthma, their families, the health care system, schools and workplaces.

Hospital Discharges Among Adults: Burden

For the year 2002, a total of 888 hospital discharges with a primary diagnosis of asthma occurred among adults. The 888 total represents the number of discharges and does not reflect the number of adults. A single adult could account for more than 1 of the hospital discharges reflected in the 888 total. There were fewer hospital discharges among 65 years and older compared to younger adult age groups. Between males and females, hospital discharges were greater in number among females, 670 compared to males, 218. For both males and females, lower SES groups had higher numbers of hospital discharges compared to higher SES groups.

Hospitalization Discharges (absolute numbers) among Rhode Island adults with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002 **#** **HDD**



Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if sample size denominator is < 50 or numerator < 5.

Hospital Discharges Among Adults: Disparities

Although the number of discharges is higher among 18-44 year olds compared to 65 and older, the hospitalization discharge proportion reveals a slightly different picture. The number of hospital discharges for each population segment, for example 18-44 year olds, divided by the estimated number of 18-44 year olds with current asthma (RI HIS) and multiplied by 1,000, yielded a proportion less than observed among 65 and older. The discharge proportion for 65 and older was 30.0 hospitalizations per 1,000 adults aged 65 and older estimated to currently have asthma. On the same measure, 10.4 hospitalizations occurred per 18-44 year olds estimated to currently have asthma. As noted in the hospital discharge burden section above, a single individual could account for more than 1 of the hospitalizations. The higher proportion observed in a

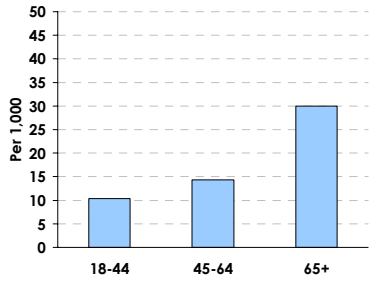
particular age group could reflect a small number of individuals who are frequently hospitalized for asthma. The number of hospitalizations per 1,000 adults for females revealed a proportion of 16.1 hospitalizations compared to males, 10.1 hospitalizations. The discharge proportion for all adults was 14.3 hospitalizations per 1,000 adults estimated to currently have asthma.

Hospitalization Discharge proportion∂ among Rhode Island adults with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002

Per 1,000 **HDD**

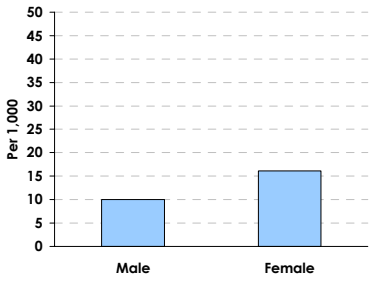
AGE

Figure 155



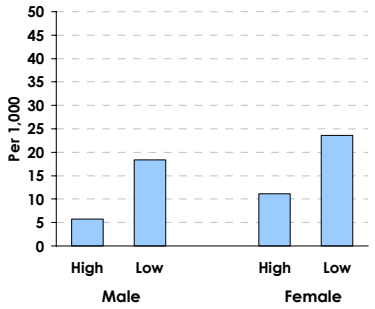
SEX

Figure 156



SES

Figure 157



Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if sample size denominator is < 50 or numerator < 5
∂ Numerator is number of hospital discharges. Denominator is estimated number of individuals with current asthma (RI HIS). Per 1,000.

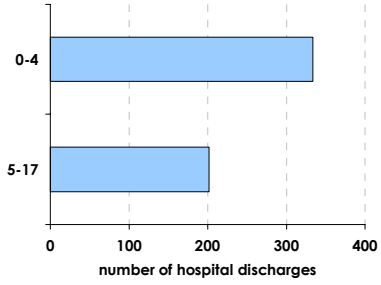
Hospital Discharges Among Children: Burden

There was a total of 536 hospital discharges among children aged 0 -17 with a primary diagnosis of asthma. When viewing these numbers, it is important to note that there is increased difficulty assigning a diagnosis of asthma for children under the age of two as some asthma symptoms are similar to other respiratory diagnoses. This may lead to an under or over representation of children with asthma under the age of two. Again, a single child could account for more than 1 of the hospital discharges reflected in the total. The number of hospital discharges was higher among males, 336, compared to females, 200.

Hospitalization Discharges (absolute numbers) among children with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002 **# HDD**

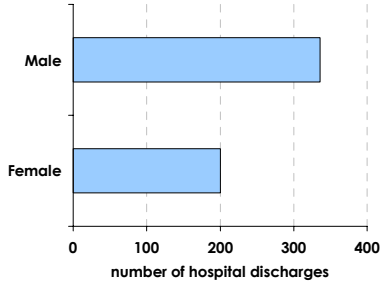
AGE

Figure 158



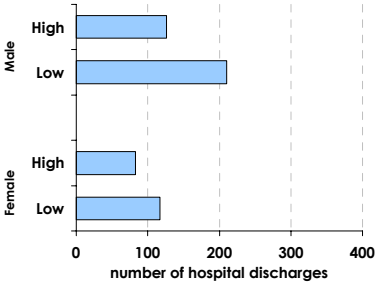
SEX

Figure 159



SES

Figure 160



Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.

Hospital Discharges Among Children: Disparities

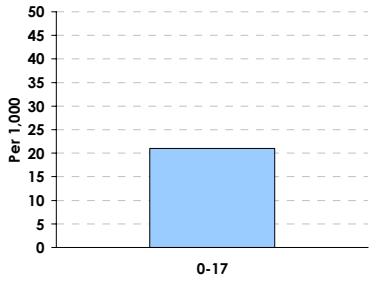
The number of hospital discharges for children 17 and younger with a primary diagnosis of asthma divided by the estimated number of children 17 and younger with current asthma (RI HIS) and multiplied by 1,000, yielded a discharge proportion of 21 hospitalizations per 1,000 children estimated to have asthma. The discharge proportion for females 17 and younger was 19 hospitalizations per 1,000 females estimated to currently have asthma and 23 hospitalizations per 1,000 for males.
As noted in the hospital discharge burden section above, a single child could account for more than 1 of the hospitalizations. The higher proportion observed in a particular group could reflect a small number of children who are frequently hospitalized for asthma.

Hospitalization Discharge proportion∂ among children with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002

Per 1,000 **HDD**

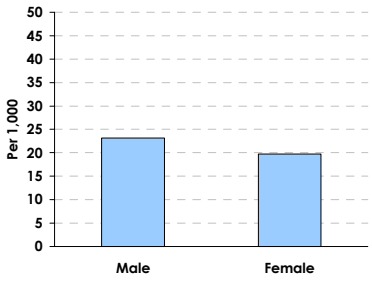
AGE

Figure 161



SEX

Figure 162



SES

DNS*

Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.
* Data not shown if sample size denominator is < 50 or numerator < 5.
∂ Numerator is number of hospital discharges. Denominator is estimated number of individuals with current asthma (RI HIS). Per 1,000.

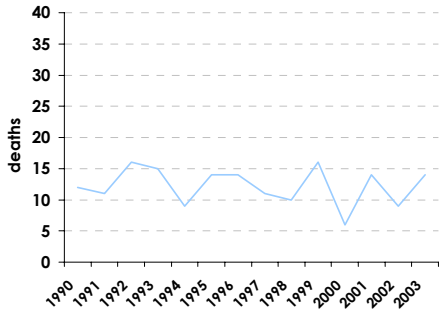
ASTHMA DEATHS IN RHODE ISLAND

Deaths due to asthma are preventable. In Rhode Island, in a single year, there are approximately 12 deaths. Mortality data from the Rhode Island Department of Health Office of Vital Record and the Office of Health Statistics on deaths due to asthma for the years 1990 to 2003 are presented below. The data are based on asthma as the underlying cause of death.

Over the past 13 years, the number of asthma deaths annually has remained relatively stable. Except for year 2000 where the number of deaths fell to a low of 6, the number of deaths attributed to asthma have generally maintained between 10 and 14 deaths per year.

Asthma mortality (absolute numbers) In Rhode Island for all ages by year, 1990-2003. **# VITAL**

Figure 163



Source: Rhode Island Department of Health Vital Records. Underlying cause of death

SUMMARY OF FINDINGS

Asthma Prevalence

For 2001-2002, an estimated 13 percent adults aged 18 and older in Rhode Island have ever been told they have asthma while for the same population, an estimated 9 percent currently have asthma (BRFSS 2002). An estimated 20 percent of children in grades 6-8 have ever been told they have asthma (YTS 2003). An estimated 10 percent of children aged 0-17 currently have asthma (RI HIS 2001). Research suggests that asthma diagnosis for children younger than 2 years of age may not be definitive. For both adults and children alike, these estimates are slightly greater than national estimates.

Asthma Disparities

Amid this elevated prevalence, disparities in asthma among RI adults, in general, divide along age, sex, and SES lines as revealed by the social map. These data suggest children compared to adults, adult women compared to men, and lower SES adults compared to higher SES, generally suffer greater disparities across the asthma continuum – prevalence, exposure to triggers, and health consequences. Data from the BRFSS 2002 and YTS 2003 underscores both the challenges and efforts needed to be in place for Rhode Island to effectively manage asthma amongst all its residents.

Sample Size

The number of individuals that had asthma, the sample size, was relatively small. This may prevent seeing an association when in fact, an association exists. This is particularly relevant for the sample size of males throughout the all analysis and in any analysis other than asthma prevalence. For example the number of individuals with asthma in the sample and exposure to any of the four asthma triggers or any asthma control measures was small. Again, this may prevent us seeing an association when in fact an association does exist.

Key Findings

In Rhode Island;

- An estimated 1 in 8, (13 percent), adults aged 18 and older have ever been told they have asthma (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 5 children, (20 percent), in grades 6-12 have ever been told they have asthma (lifetime asthma), (YTS 2003)
- An estimated 1 in 7, (15 percent), women 18 and older have ever been told they have asthma, (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 10, (10 percent), men aged 18 and older have ever been told they have asthma (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 6, (17 percent) lower SES women aged 18 and older have ever been told they have asthma (lifetime asthma), (BRFSS 2002)
- An estimated 1 in 7, (15 percent), Black or African American Non-Hispanic adults reported having ever been told they have asthma (BRFSS 2001-2003)
- Approximately 40 percent of adults in Rhode Islander with lifetime asthma are exposed to at least 1 of 4 asthma triggers (current smoker, ETS, home dampness or mildew)
- Slightly over 64 percent of Rhode Island adults with current asthma have experienced at least one out of control asthma measure (see table 62 in appendix)

Recommendations

Collectively, these findings reveal a pattern where the intersection of sex, age, and SES places lower SES adult women aged 18-44 in RI and children in general at heightened risk for asthma burden and disparity holding true across lifetime prevalence, exposure to triggers, and associated health consequences, most notably uncontrolled asthma. Although these disparities are consistent with national data, estimated asthma prevalence among adults and children in RI is slightly higher than national estimates.

Moreover, in the absence of both a clear understanding on the cause of asthma and a cure, asthma management is focal in Rhode Island's efforts aimed at reducing health consequences - preventable hospitalizations, asthma attacks and limitations with social roles and activities of daily living. Through medical care of asthma symptoms paired with avoidance of asthma triggers, Rhode Island commits to reducing asthma burden and disparities for all Rhode Islanders. That said, data suggest what is needed are enhanced interventions targeting populations where the absolute numbers of individuals with asthma is high, and subpopulations where the relative proportion of individuals in that subpopulation who have asthma is greater than in other subpopulations. Such populations include, children, women, lower SES, and racial and ethnic minorities. Findings from this report paired with input directly from individuals with asthma will inform interventions and policies tailored to the needs of individuals with asthma.

Additionally, and in relation to surveillance discussed in more detail below, in the Rhode Island Response to Asthma, small sample size limited the overlay of the social mapping onto racial and ethnic populations. Efforts in the Rhode Island Department of Health are ongoing to enlarge the sample size of racial and ethnic populations allowing for data analysis, reporting and greater precision with targeting populations most affected and tailoring interventions well-matched to those populations.

The Rhode Island Department of Health in collaboration with community programs, the health care community, and policy makers has detailed a comprehensive response to asthma in Rhode Island. Only through a collaborative state-wide effort will Rhode Island be effective at improving the quality of lives for individuals with asthma and their families.

THE RHODE ISLAND RESPONSE TO ASTHMA

After reviewing the burden of asthma to Rhode Islanders, available asthma control strategies, and national *Healthy People 2010* objectives, the Asthma Control Coalition selected objectives in the following six key areas to address the RI problem:

Asthma Surveillance
Assessment of Environmental Triggers
Public Education
Professional Education: Primary Care Providers
Professional Education: School Nurse Teachers
Advocacy for Asthma-Friendly Policies

These interventions were proposed with the input of many stakeholders over a period of three years and are described in this section. They were developed as "SMART" objectives: specific, measurable, achievable, realistic, and timely.

Asthma Surveillance

The goals and objectives for asthma surveillance are outlined in the Asthma Control Plan and represent priorities stated by the Asthma Coalition. The objectives, broadly stated, include the following.

- Objective 1: In addition to BRFSS core asthma questions, continue inclusion of the CDC BRFSS asthma adult module, child asthma module, RI state-added indoor air quality questions, and add work-related asthma and school absence items.
- Objective 2: Analyze data from a newly developed surveillance data set projected to start January 2005 from hospital emergency department (ED) billing records to monitor ED visits for asthma.
- Objective 3: Develop and pilot a survey instrument to evaluate environmental triggers and asthma management in every RI public school at least once every four years.
- Objective 4: Include in the regularly scheduled HEDIS documentation from the major health insurance plans submitted to the RI Department of Health Office of Performance Measurement of Health Plans the HEDIS effectiveness of care measure, use of appropriate medications for people with asthma for the 3 age groups – 5 to 9, 10 to 17, and 18 to 56 and the combined data.
- Objective 5: Receive, analyze, and report annually, data from the RI Department of Education Annual School Health Report on asthma triggers in RI schools.

Assessment of Environmental Triggers

The goal of this intervention is to build infrastructure for the assessment of environmental triggers of asthma in schools and workplaces. The objective for this goal is to train field staff at the HEALTH and ALARI to advise schools and workplaces on the control of environmental triggers for asthma. Toward this end, CDC asthma awarded funds have been channeled through the RI Department of Health Asthma Control Program into the community, and collaboratively, the Asthma Control Program and Asthma Coalition will design implement and evaluate interventions aimed at school and workplace policies for the reduction of asthma triggers.

Public Education

The goal of the public education intervention is to support patient and family education for asthma management through public education. The overall objective for this goal is to maintain an on-going comprehensive public asthma education program focusing on avoiding second-hand smoke, having an asthma action plan, getting a flu shot every fall, and taking asthma seriously. The four parts that support this objective are (1) to field annual multi-channel public education campaigns that associate asthma with exposure to second-hand smoke; (2) to field annual on-going multi-channel public education campaigns to promote the use of asthma action plans by asthma patients and their families; (3) to field annual multi-channel public education campaigns to promote flu shots for all people with asthma; and (4) to field an on-going, diverse public education program for asthma patients and their families from high-risk, under-served communities, focusing on inner city Providence, and expanding to low income areas of Pawtucket/Central Falls, Woonsocket, and Newport.

Professional Education: Primary Care Providers

The goal of this intervention is to improve professional education on the diagnosis, treatment, and management of asthma in RI. The overall objective for this goal is to field an ongoing *Asthma Update* program for PCPs, stressing the use of approved guidelines for the diagnosis and treatment of asthma, the use of written asthma action plans for every asthma patient, and the need for comprehensive patient and family education to manage asthma. The five parts that support this objective are (1) to mail an update of the Asthma Control Plan's (ACP's) *Quick Reference Guide for Asthma Diagnosis and Treatment* to PCPs; (2) to mail an update of the ACP's *Asthma Action Plan* to PCPs; (3) to fax a one-page *Asthma Abstract* to PCPs in April, July, and October of each year, containing a summary of the latest advances in asthma diagnosis, treatment, and patient education from the medical literature; (4) to organize a series of *Asthma Update* brief trainings to be held throughout each year for specialists from the Coalition to update PCPs on advances in asthma diagnosis, treatment, and patient education, and engage in questions and answers about hypothetical cases; and (5) to sponsor asthma presentations at major meetings of PCPs.

Professional Education: School Nurse Teachers

The goal of this intervention is to improve professional education for the management of asthma in Rhode Island schools. The overall objective for this goal is to field an ongoing *Asthma Update* program for RI school nurse teachers (SNTs). The four parts that support this objective are (1) to mail an update of the ACP's *Quick Reference Guide for Asthma Diagnosis and Treatment* to SNTs; (2) to produce and mail to SNTs a chapter on *Best Practices for the Support of Self-Management of Asthma by Students with Asthma* for a chronic disease management manual to be used in public and private schools, grades K-12; (3) to mail a two-page *Asthma Update* to SNTs in September and February of each year, to support self-management by students with asthma; and (4) to sponsor an asthma presentation at annual meetings of SNTs organized by HEALTH.

Advocacy for Asthma-Friendly Policies

The goal of this intervention is to build advocacy for asthma-friendly policies to reduce asthma triggers and to improve health care for asthma. The overall objective for this goal is to field an ongoing comprehensive asthma advocacy program for asthma-friendly policies in the

construction and maintenance of homes, schools, and workplaces, and develop asthma-friendly health care policies among third-party payers in the state.

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APPENDIX A: DATA SOURCES

Rhode Island Behavioral Risk Factor Surveillance System (RI BRFSS) – 2002
The BRFSS is a national telephone survey administered in all 50 states and 4 U.S. territories by Centers for Disease Control and Prevention (CDC) of randomly selected adults aged 18 and older who live in households with telephones. The survey asks respondents questions about a variety of health-related behaviors and conditions, including asthma. Rhode Island has participated in the BRFSS since 1984 and a professional survey contractor has conducted the BRFSS in Rhode Island since 1990.

For the year 2002, Rhode Island, along with approximately 19 other states received funding to administer the CDC BRFSS Adult Asthma Module. This module contains a series of questions focusing on asthma control variables. (See Appendix D).

Additionally, Rhode Island administered in the year 2002 state added questions supplying data on tobacco use, exposure to environmental tobacco smoke in the home, home dampness and home mildew.

Rhode Island Health Interview Survey (RI HIS) – 2001
The RI HIS is a telephone survey that collects and analyzes data for all members of contacted households on a variety of health topics including asthma. The survey is conducted by phone with an adult member of a randomly selected telephone household. The adult with the most knowledge on health and health care of all household members reports for each household member. The RI-HIS data for this report was administered in 2001.

Rhode Island Youth Tobacco Surveillance Survey (RI YTS) – 2003
The Office of Health Statistics conducts the YTS among Rhode Island public school students in grades 6-8 and grades 9-12. The YTS survey collects in depth information in grades 6-8 and grades 9-12 regarding tobacco use and includes two questions on asthma. The Centers for Disease Control and Prevention (CDC) provides technical assistance to over 40 states and U.S. territories to administer the YTS. Rhode Island data which are representative of the entire population of public middle school and public high school students.

Hospital Discharge Data (HDD) – 2002, 2003
The Hospital Discharge Data contains data on inpatient discharges from the licensed acute care hospitals and one rehabilitation facility in Rhode Island including information on asthma inpatient discharges. The Hospital Discharge Data currently contain patient-level information for all inpatients discharged from the eleven general hospitals, two psychiatric hospitals, and one inpatient rehabilitation facility in Rhode Island.

Vital Records (births and deaths) – 1990-2003
The Rhode Island Department of Health Office of Vital Records is the State agency responsible for the registration, filing, and maintenance of vital records (legal documents of birth, death, and marriage) in RI, and the periodic publication of data derived from them.

APPENDIX B: DETAILED DATA TABLES
ASTHMA PREVALENCE IN RHODE ISLAND

Current Asthma Prevalence Among Adults

Current Asthma Prevalence Among Adults: Burden

Table 1 (Figures 1,2,3) Estimated number of Rhode Island adults (in 1000's) with current asthma by SES, sex, and age, 2002. **# BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44	10033	13335	6770	9222	15795	22286	37964
45-64	5141	9877		6307	6170	16175	22310
65+		3999		3224	3507	7476	11000
18+	17320	27972	9038	18299	25624	45798	71279

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 2 (Figures 4,5,6) Estimated number of Rhode Island adults (in 1000's) with current asthma by SES, sex, and age, 2001. **# HIS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44	8546	12377	4336	9143	13396	21870	34290
45-64	3921	9146	2431	5539	5821	14076	19911
65+	1704	2974	688	2251	2358	5723	8097
18+	14172	24497	7454	16933	21575	41669	62299

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Table 3 (Figures 7,8,9) Estimated percentage of Rhode Island adults with current asthma, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44	8.1 %	10.3 %	8.9 %	11.7 %	7.9 %	10.7 %	9.3 %
45-64	5.9 %	10.8 %		19.7 %	5.3 %	13.1 %	9.3 %
65+		6.2 %		11.6 %	5.8 %	8.1 %	7.2 %
18+	6.8 %	9.8 %	7.4 %	13.2 %	6.8 %	10.8 %	8.9 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 4 (Figures 10,11,12) Estimated percentage of Rhode Island adults with current asthma, by SES, sex, and age, 2001. **%** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44	6.9 %	9.56 %	5.7 %	11.6 %	6.7 %	10.5 %	8.4 %
45-64	4.5 %	10.0 %	8.3 %	17.3 %	5.0 %	11.4 %	8.3 %
65+	3.9 %	4.61 %	4.1 %	8.1 %	3.9 %	6.2 %	5.3 %
18+	5.7 %	8.9 %	5.8 %	11.5 %	5.7 %	9.7 %	7.8 %

Source: Weighted data from Rhode Island Health Interview Survey, 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Lifetime Asthma Prevalence Among Adults

Lifetime Asthma Prevalence Among Adults: Burden

Table 5 (Figures 13,14,15) Estimated number of Rhode Island adults (in 1000's) with lifetime asthma by SES, sex, and age, 2002. **#** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44	15483	19679	9053	13478	25792	32492	58375
45-64	7668	13719	2314	7012	9663	20867	30467
65+	2491	5935	1493	3835	4596	9784	14361
18+	25980	40246	12701	23844	39944	63185	103315

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Lifetime Asthma Prevalence Among Adults: Disparities

Table 6 (Figures 16,17,18) Estimated percentage of Rhode Island adults with lifetime asthma, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44	12.5 %	15.2 %	11.9 %	17.1 %	12.9 %	15.6 %	14.3 %
45-64	8.8 %	15.0 %	7.9 %	21.9 %	8.3 %	16.9 %	12.7 %
65+	5.7 %	9.2 %	8.9 %	13.8 %	7.6 %	10.6 %	9.4 %
18+	10.2 %	14.1 %	10.4 %	17.2 %	10.6 %	14.9 %	12.9 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Asthma Prevalence Among Children: Lifetime and Current

Lifetime Asthma Prevalence Among Children: Burden

Table 7 (Figures 19,20) Estimated number of Rhode Island children (in 1000's) with lifetime asthma among children by grade and sex, 2003. **#** **YTS**

Grade	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
6th - 8th					4092	3543	7599
9th - 12th					4654	4521	9175

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 8 (Figures 21,22) Estimated number of Rhode Island children (in 1000's) with current asthma by sex, and age, 2001. **#** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
0-17					14575	10171	24751

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if or weighted relative standard error > 30%

Table 9 (Figures 23,24) Estimated percentage of Rhode Island children with lifetime asthma among children by grade and sex, 2003. **%** **YTS**

Grade	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
6th - 8th	DNA	DNA	DNA	DNA	23.1 %	21.0 %	22.1 %
9th - 12th	DNA	DNA	DNA	DNA	22.8 %	21.6 %	22.2 %

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%
DNA: Data not available

Table 10 (Figures 25,26) Estimated percentage of Rhode Island children with current asthma, by sex, and age, 2001. **%** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
0-17					11.4 %	8.5 %	10.0 %

Source: Weighted data from RI HIS 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

ASTHMA TRIGGERS IN RHODE ISLAND

Exposure to 1 of 4 Asthma Triggers: Combined Measure

Exposure to 1 of 4 Asthma Triggers: Burden

Table 11 (Figures 27,28,29) Estimated number of Rhode Island adults (in 1000's) with lifetime prevalence exposed to 1 of 4 triggers by SES, sex, and age, 2002. **# BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					12303	14102	26444
45-64						2963	11516
65+							3059
18+	8625	16541		11731	14979	25906	41016

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 12 (Figures 30,31,32) Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to 1 of 4 triggers by SES, sex, and age, 2001. **# HIS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44							16871
45-64							8184
65+							
18+	5796	10117		8585	8781	18626	26975

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Table 13 (Figures 33,34,35) Estimated percentage of Rhode Island adults with lifetime prevalence exposed to 1 of 4 triggers, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					47.7 %	43.4 %	45.3 %
45-64						14.2 %	37.8 %
65+							21.3 %
18+	33.2 %	41.1 %		49.2 %	37.5 %	41.0 %	39.7 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 14 (Figures 36,37,38) Estimated percentage of Rhode Island adults with current asthma exposed to 1 of 4 trigger, by SES, sex, and age, 2001. **%** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44							49.2 %
45-64							41.1 %
65+							
18+	40.9 %	41.3 %		50.7 %	40.7 %	44.7 %	43.3 %

Source: Weighted data from Rhode Island Health Interview Survey, 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Tobacco Use

Smoking Status Among Adults: Burden

Table 15 (Figures 39,40,41) Estimated number of Rhode Island adults (in 1000's) with lifetime asthma who smoke by SES, sex, and age, 2002. **#** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					9904	9293	19322
45-64						6072	7282
65+							
18+	4988	9418		9204	10985	17123	28205

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 16 (Figures 42,43,44) Estimated number of Rhode Island adults (in 1000's) with current asthma who smoke by SES, sex, and age, 2001. **#** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44						5970	7510
45-64						2463	3604
65+							
18+		4581		4149	2891	8625	11338

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Table 17 (Figures 45,46,47) Estimated percentage of Rhode Island adults with lifetime asthma who smoke, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					38.4 %	28.6 %	33.1 %
45-64						29.1 %	23.9 %
65+							
18+	19.2 %	23.4 %		38.6 %	27.5 %	27.1 %	27.3 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 18 (Figures 48,49,50) Estimated percentage of Rhode Island adults with current asthma who smoke, by SES, sex, and age, 2001. **%** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44						27.3 %	21.9 %
45-64						17.5 %	18.1 %
65+							
18+		18.7 %		24.5 %	13.4 %	20.7 %	18.2 %

Source: Weighted data from Rhode Island Health Interview Survey, 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Smoking Status Among Children: Burden

Table 19 (Figures 51,52) Estimated number (in 1000's) of Rhode Island children with lifetime asthma who smoke by grade and sex, 2003. **# YTS**

Grade	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
6th - 8th	DNA	DNA	DNA	DNA			
9th - 12th	DNA	DNA	DNA	DNA	809	756	1565

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%
DNA: Data not available

Smoking Status Among Children: Disparities

Table 20 (Figures 53,54) Estimated percentage of Rhode Island children with lifetime asthma who smoke by grade and sex, 2003. **% YTS**

Grade	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
6th - 8th							
9th - 12th					17.1 %	16.7 %	17.0 %

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Environmental Tobacco Smoke (ETS)

Exposure to ETS Among Adults With Asthma: Burden

Table 21 (Figures 55,56,57) Estimated number of Rhode Island adults (in 1000's) with lifetime asthma exposed to ETS by SES, sex, and age, 2002. **#** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					4152	5491	9690
45-64						5342	6794
65+							
18+	4365	7888		5866	5792	12763	18493

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 22 (Figures 58,59,60) Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to ETS by SES, sex, and age, 2001. **#** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					2304	4790	6892
45-64						3153	3664
65+							
18+	1545	5095		3539	3301	8709	11338

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Table 23 (Figures 61,62,63) Estimated percentage of Rhode Island adults with lifetime asthma exposed to ETS, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					16.1 %	16.9 %	16.6 %
45-64						25.6 %	22.3 %
65+							
18+	16.8 %	19.6 %		24.6 %	14.5 %	20.2 %	17.9 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 24 (Figures 64,65,66) Estimated percentage of Rhode Island adults with current asthma exposed to ETS, by SES, sex, and age, 2001. **%** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					17.2 %	21.9 %	20.1 %
45-64						22.4 %	18.4 %
65+							
18+	10.9 %	20.8 %		20.9 %	15.3 %	20.9 %	18.2 %

Source: Weighted data from Rhode Island Health Interview Survey, 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Exposure to ETS Among Children with Asthma: Burden

Table 25 Figures 67,68) Estimated number (in 1000's) of Rhode Island children with lifetime asthma exposed to ETS by grade and sex, 2003. **# YTS**

Grade	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
6th - 8th	DNA	DNA	DNA	DNA	1480	1413	2893
9th - 12th	DNA	DNA	DNA	DNA	1966	1780	3745

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%
DNA: Data not available

Exposure to ETS Among Children with Asthma: Disparities

Table 26 Figures 69,70) Estimated percentage of Rhode Island children with lifetime asthma exposed to ETS by grade and sex, 2003. **% YTS**

Grade	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
6th - 8th	DNA	DNA	DNA	DNA	37.0 %	40.5 %	38.6 %
9th - 12th	DNA	DNA	DNA	DNA	43.1 %	39.4 %	41.2 %

Source: Weighted data from Youth Tobacco Survey 2003
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%
DNA: Data not available

Damp Housing and Mold Conditions

Exposure to Damp Housing Among Adults with Asthma: Burden

Table 27 (Figures 71,72,73) Estimated number of Rhode Island adults (in 1000's) with lifetime asthma exposed to home dampness by SES, sex, and age, 2002. **#** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44						4127	7881
45-64						2358	3077
65+							
18+		4870		3052		6887	11675

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 28 (Figures 74,75,76) Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to home dampness by SES, sex, and age, 2001. **#** **HIS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					3202	5796	8744
45-64							1892
65+							
18+	3004	4924		2658	4056	7750	11588

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Table 29 (Figures 77,78,79) Estimated percentage of Rhode Island adults with lifetime asthma exposed to home dampness, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44						12.7 %	13.5 %
45-64						11.3 %	10.1 %
65+							
18+		12.1 %		12.8 %		10.9 %	11.3 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 30 (Figures 80,81,82) Estimated percentage of Rhode Island adults with current asthma exposed to home dampness, by SES, sex, and age, 2001. **%** **HIS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					23.9 %	26.5 %	25.5 %
45-64							9.5 %
65+							
18+	21.2 %	20.1 %		15.7 %	18.8 %	18.6 %	18.6 %

Source: Weighted data from Rhode Island Health Interview Survey, 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Exposure to Home Mildew Among Adults with Asthma: Burden

Table 31 (Figures 83,84,85) Estimated number of Rhode Island adults (in 1000's) with lifetime asthma exposed to home mildew by SES, sex, and age, 2002. **#** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					1496	2567	4028
45-64						2024	2468
65+							
18+				2885		4992	7025

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 32 (Figures 86,87,88) Estimated number of Rhode Island adults (in 1000's) with current asthma exposed to home mildew by SES, sex, and age, 2001. **#** **HIS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44						3324	4218
45-64						2294	3206
65+							
18+		3234		2811	2287	6000	8161

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Table 33 (Figures 89,90,91) Estimated percentage of Rhode Island adults with lifetime asthma exposed to home mildew, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					5.8 %	7.9 %	6.9 %
45-64						9.7 %	8.1 %
65+							
18+				12.1 %		7.9 %	6.8 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Table 34 (Figures 92,93,94) Estimated percentage of Rhode Island adults with current asthma exposed to home mildew, by SES, sex, and age, 2001. **%** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44						15.2 %	12.3 %
45-64						16.3 %	16.1 %
65+							
18+		13.2 %		16.6 %	10.6 %	14.4 %	13.1 %

Source: Weighted data from Rhode Island Health Interview Survey, 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Flu Shots

Flu Shots Among Adults with Asthma: Burden

Table 35 (Figures 95,96,97) Estimated number of Rhode Island adults (in 1000's) with lifetime asthma received flu shot by SES, sex, and age, 2002. **#** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					6654	12120	18797
45-64						12124	16604
65+							10857
18+	8443	20083	4814	11707	14619	31656	46285

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Flu Shots Among Adults with Asthma: Disparities

Table 36 (Figures 98,99,100) Estimated percentage of Rhode Island adults with lifetime asthma received flu shot, by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					25.8 %	37.3 %	32.2 %
45-64						58.1 %	54.5 %
65+							75.6 %
18+	32.5 %	49.9 %	37.9 %	49.1 %	36.6 %	50.1 %	44.8 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

ASTHMA CONTROL IN RHODE ISLAND

Rescue Inhaler Use

Rescue Inhaler Use Among Adults: Burden

Table 37 (Figures 101,102,103) Estimated number of Rhode Island adults (in 1000's) with current asthma and rescue inhaler use greater than 2x/week by SES, sex, and age, 2001. **#** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					3228	4636	7647
45-64					1356	3829	5177
65+							
18+	2820	5512	2773	3979	5005	9334	14142

Source: RI Health Interview Survey 2001. Based on 2000 Census and weighted RI HIS 2001%.
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if weighted relative standard error > 30%

Rescue Inhaler Use Among Adults: Disparities

Table 38 (Figures 104,105,106) Estimated percentage of Rhode Island adults with current asthma and rescue inhaler use greater than 2x/week by SES, sex, and age, 2001. **%** **HIS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					24.1 %	21.2 %	22.3 %
45-64					23.3 %	27.2 %	26.0 %
65+							
18+	21.2 %	21.4 %		24.1 %	23.2 %	22.4 %	22.7 %

Source: Weighted data from Rhode Island Health Interview Survey, 2001
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Day symptoms

Day Symptoms: Burden

Table 39 (Figures 107,108,109) Estimated number of Rhode Island adults (in 1000's) with current asthma and day symptoms by SES, sex, and age, 2002. **#** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					4375	6820	11199
45-64						5208	6715
65+							
18+	4347	6322		8765	7457	16808	22168

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002 %
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Day Symptoms: Disparities

Table 40 (Figures 110,111,112) Estimated percentage of Rhode Island resident with current asthma and day symptoms by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44					27.7 %	30.6 %	29.5 %
45-64						32.2 %	30.1 %
65+							
18+	25.1 %	22.6 %		47.9 %	29.1 %	36.7 %	31.1 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Night Symptoms

Night Symptoms: Burden

Table 41 (Figures 113,114,115) Estimated number of Rhode Island adults (in 1000's) with current asthma night symptoms by SES, sex, and age, 2002. **#** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44							10706
45-64							5377
65+							
18+		7077		6752	5586	13785	19816

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Night Symptoms: Disparities

Table 42 (Figures 116,117,118) Estimated percentage of Rhode Island adults with current asthma and night symptoms by SES, sex, and age, 2002. **%** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44							28.2 %
45-64							24.1 %
65+							
18+		25.3 %		36.9 %	21.8 %	30.1 %	27.8 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Emergency Room Visits

Emergency Room Visits: Burden

Table 43 (Figures 119,120,121) Estimated number of Rhode Island adults (in 1000's) with current asthma and ER visits by SES, sex, and age, 2002. **#** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44							7175
45-64							3927
65+							
18+		4559		4154	3485	8793	12474

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Emergency Room Visits: Disparities

Table 44 (Figures 122,123,124) Estimated percentage of Rhode Island adults) with current asthma and ER visits by SES, sex, and age, 2002. **%** **BRFSS**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44							18.9 %
45-64							17.6 %
65+							
18+		16.3 %		22.7 %	13.6 %	19.2 %	17.5 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Asthma Attacks

Asthma Attacks: Burden

Table 45 (Figures 125,126,127) Estimated number of Rhode Island adults (in 1000's) with current asthma and asthma attacks by SES, sex, and age, 2002. **#** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					5196	15066	20387
45-64						7732	9660
65+							3751
18+	5698	14881		10833	8892	24502	33715

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Asthma Attacks: Disparities

Table 46 (Figures 128,129,130) Estimated percentage of Rhode Island adults with current asthma and asthma attacks by SES, sex, and age, 2002. **%** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					32.9 %	67.6 %	53.7 %
45-64						47.8 %	43.3 %
65+							34.1 %
18+	32.9 %	53.2 %		59.2 %	34.7 %	53.5 %	47.3 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Urgent Care Visits

Urgent Care Visits: Burden

Table 47 (Figures 131,132,133) Estimated number of Rhode Island adults (in 1000's) with current asthma and urgent visits by SES, sex, and age, 2002. **#** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44							11237
45-64							5622
65+							
18+	3239	7944		8106	4228	15022	19459

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Urgent Care Visits: Disparities

Table 48 (Figures 134,135,136) Estimated percentage of Rhode Island adults with current asthma and urgent visits by SES, sex, and age, 2002. **%** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44							29.6 %
45-64							25.2 %
65+							
18+	18.7 %	28.4 %		44.3 %	16.5 %	32.8 %	27.3 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Activity Limitations Attributed To Asthma

Activity Limitations Attributed to Asthma: Burden

Table 49 (Figures 137,138,139) Estimated number of Rhode Island adults (in 1000's) with current asthma and limitations by SES, sex, and age, 2002. **#** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44							13781
45-64							7251
65+							
18+	4971	10042		8399	6611	17907	24520

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Activity Limitations Attributed to Asthma: Disparities

Table 50 (Figures 140,141,142) Estimated percentage of Rhode Island adults with current asthma and limitations by SES, sex, and age, 2002. **%** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44							36.3 %
45-64							32.5 %
65+							
18+	28.7 %	35.9 %		45.9 %	25.8 %	39.1 %	34.4 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Summary Control Measure (BRFSS 2002)

Summary Control Measure: Burden

Table 51 (Figures 143,144,145) Estimated number of Rhode Island adults (in 1000's) with current asthma control summary by SES, sex, and age, 2002. **#** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					8403	16759	25056
45-64						10902	13877
65+							6853
18+	9734	18546		14621	13683	31601	45832

Source: Behavioral Risk Factor Surveillance, 2002. Based on 2000 Census and weighted BRFSS 2002%
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

Summary Control Measure: Disparities

Table 52 (Figures 146,147,148) Estimated percentage of Rhode Island adults with current asthma and control summary by SES, sex, and age, 2002. **%** **BRFSS**

Ages	Higher SES Male	Higher SES Female	Lower SES Male	Lower SES Female	Male	Female	All
18-44					53.2 %	75.2 %	66.0 %
45-64						67.4 %	62.2 %
65+							62.3 %
18+	56.2 %	66.3 %		79.9 %	53.4 %	69.0 %	64.3 %

Source: Weighted data from Behavioral Risk Factor Surveillance 2002
Note: See Methods (page 10) for definitions of higher SES and lower SES
Gray cells: Data not shown if weighted relative standard error > 30%

ASTHMA HOSPITALIZATIONS IN RHODE ISLAND

Adults: Burden

Table 53 (Figures 149,150,151) Hospitalization Discharges (absolute numbers) among Rhode Island adults with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002 **#** **HDD**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44	34	88	71	164	105	252	357
45-64	22	91	43	129	67	220	285
65+	25	92	23	106	48	198	246
18+	81	271	137	399	218	670	888

Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.

Adults: Disparities

Table 54 (Figures 152,153,154) Hospitalization Discharge rates∂ (per 1,000) among Rhode Island adults with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002 **Per 1,000** **HDD**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
18-44	3.9	7.1	16.4	17.9	7.8	11.5	10.4
45-64	5.6	9.9		28.3	11.5	15.6	14.3
65+	14.7	31.0	33.3	47.1	20.4	34.6	30.0
18+	5.7	11.1	18.4	23.6	10.1	16.1	14.3

Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if sample size for denominator is < 50 or numerator < 5
∂ Numerator is number of hospital discharges. Denominator is estimated number of individuals with current asthma (RIHIS). Per 1,000

Children: Burden

Table 55 (Figures 155,156,157) Hospitalization Discharges (absolute numbers) among children with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002 **#** **HDD**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
0-4	83	46	137	68	220	114	334
5-17	43	37	73	49	116	86	202
0-17	126	83	210	117	336	200	536

Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.

Children: Disparities

Table 56 (Figures 158,159,160) Hospitalization Discharge rates∂ (per 1,000)among children with primary diagnosis of asthma in Rhode Island by age, sex, SES, 2002 **Per 1,000** **HDD**

Ages	***Higher SES*** Male	***Higher SES*** Female	***Lower SES*** Male	***Lower SES*** Female	Male	Female	All
0-4							
5-17							
0-17					23.1	19.7	21.7

Source: Rhode Island hospital discharge data, 2002. Office of Health Statistics
Note: See Methods (page 10) for definitions of higher SES and lower SES.
Gray cells: Data not shown if sample size for denominator is < 50 or numerator < 5
∂ Numerator is number of hospital discharges. Denominator is estimated number of individuals with current asthma (RIHIS). Per 1,000.

ASTHMA DEATHS IN RHODE ISLAND

Table 56 (Figure 161) Asthma Mortality (absolute numbers) In Rhode Island For All Ages By Year, 1990-2003 **% VITAL**

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Deaths	12	11	16	15	9	14	14	11	10	16	6	14	9	14

Source: Rhode Island Department of Health Vital Records. Underlying cause of death

APPENDIX C: HEALTHY PEOPLE 2010

By 2010:

1. Reduce asthma deaths

	US 1998 Baseline	2010 Target	US 2001
Rate per million			
1.a. Children under age 5 years	2.1	1.0	2.1
1.b. Children aged 5 to 14 years	3.3	1.0	2.4
1.c. Adolescents and adults aged 15 to 34 years	5.0	2.0	4.7
1.d. Adults aged 35 to 64 years	86.3	60.0	14.7

2. Reduce hospitalizations for asthma

	US 1998 Baseline	2010 Target	US 2001
Rate per 10,000			
2.a. Children under age 5 years	45.6	25	56.2
2.b. Children and adults aged 5 to 64 years*	12.5	7.7	11.8
2.c. Adults aged 65 years and older*	17.7	11	21.4

*Age adjusted to the year 2000 standard population

3. Reduce hospitalizations emergency department visits for asthma

	US 1995-97 Baseline	2010 Target	US 2001
Rate per 10,000			
3.a Children under age 5 years	150.0	80	--
3.b. Children and adults aged 5 to 64 years*	71.1	50	--
3.c. Adults aged 65 years and older*	29.5	15	--

*Age adjusted to the year 2000 standard population
-- Data not available

4. Reduce activity limitations

	US Baseline	2010 Target	US 2001
4.a. Reduce activity limitations among persons with asthma	20% (1994-96)	10%	--
4.b. (Developmental) Reduce the number of school or work days missed by person with asthma due to asthma	DNC	DNC	DNC
4.c. Increase the proportion of persons with asthma who receive formal patient education, including information about community and self-help resources, as an essential part of the management of their condition	8.4% (1998) (age adjusted to 2000)	30%	DNC
4.d. (Developmental) Increase the proportion of persons with asthma who receive appropriate asthma care according to the NAEPP Guidelines	DNC	DNC	DNC
4.e. (Developmental) Establish in at least 25 States a surveillance system for tracking asthma death, illness, disability, impact of occupational and environmental factors on asthma, access to medical care, and asthma management	DNC	DNC	DNC

-- Data not available
DNC Data for specific population are not collected

5. Environmental triggers - ETS

	US Baseline	2010 Target	US 2001
5.a. Reduce the proportion of children who are regularly exposed to tobacco smoke at home	27% (1994)	10%	--
5.b. Reduce the proportion of nonsmokers exposed to environmental tobacco smoke	65% (1988-1994)	45%	--
5.c. Increase smoke-free ant tobacco-free environments in schools, including all school facilities, property, vehicles, and school events	37% (1994)	100%	--
5.d. Increase the proportion of worksites with formal smoking policies that prohibit smoking or limit it to separately ventilated areas	79% (1998-99)	100%	--
5.e. Establish laws on smoke-free indoor air that prohibit smoking or limit it to separately ventilated areas in public places and worksites	--	--	--

-- Data not available
Source: http://wonder.cdc.gov/scripts/brroker.exe

APPENDIX D: BRFSS 2002 ADULT ASTHMA MODULE – ASTHMA CONTROL VARIABLES

Treatment of Asthma Control Variables

The BRFSS 2002 Adult Asthma History Module contained a series of asthma questions assessing the extent of the severity of asthma symptoms, asthma control.

Response choices were mixed and included a combination of categorical and continuous responses. Continuous variables were collapsed into categorical responses as outlined below. In part, the rationale for collapsing the variables was due to small numbers in each of the continuous responses and for some questions, there are no conventional standards demarcating a unique frequency of a symptom as "in control" or "out of control".

Where those standards exist, collapsing the responses into categorical variables was performed at that demarcation consistent with NHLB guidelines classifying severity of symptoms. This was true for symptoms during the day and symptoms during the night.

For all other continuous variables, variables where no NHLB guidelines classifying severity of symptoms exist, categories were formed into never having a symptom and having a symptom one or more times.

All responses "don't know/Not sure" and "Refused" were eliminated from analysis.

Asthma Control Questions

The following questions were not changed and used the original response choices:

During the past 12 months, have you had an episode of asthma or an asthma attack?

1. Yes
2. No
7. Don't' know/Not sure
9. Refused

The following questions were changed to create categorical responses where "none" was recoded to represent "in control" and 1 or more was recoded to represent "out of control".

During the past 12 months, how many timed did you visit an emergency room or urgent care center because of your asthma?

__ Number of visits
88 None
98 Don't know/Not sure
99 Refused

(Besides those emergency room visits), During the past 12 months, how many times did you see a doctor or other health professional for urgent treatment of worsening asthma symptoms?

__ Number of visits
88 None
98 Don't know/Not sure
99 Refused

During the past 12 months, how many days were you unable to work or carry out usual activities because of your asthma?

__ Number of days
888 None
777 Don't know/Not sure
999 Refused

The following questions used the NHLB guidelines on severity of symptoms to categorize responses into "in control" and "out of control".

Symptoms of asthma include cough, wheezing, shortness of breath, chest tightness and phlegm production when you don't have a cold or respiratory infection. During the past 30 days, how often did you have any symptoms?

8 Not at any time
1 Less than once a week
2 Once or twice a week
3 More than 2 times a week, but not every day
4 Every day, but not all the time
5 Every day, all the time
7 Don't know/Not sure
9 Refused

During the past 30 days, how many days did symptoms of asthma make it difficult for you to stay asleep?

8 None
1 One or two
2 Three or four
3 Five
4 Six to ten
5 More than 10
7 Don't know/Not sure
9 Refused

APPENDIX E: RHODE ISLAND HEALTH SURVEY – ASTHMA CONTROL VARIABLE

Asthma Control Question

The following questions used the NHLB guidelines on severity of symptoms to categorize responses into "in control" and "out of control".

About how often do does/ individual have to use a rescue inhaler?

Times Per:

1. Day
2. Week
3. Month
4. Year
5. Does not us a rescue inhaler
6. Does not have a rescue inhaler
8. DK
9. REF
10.